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FINAL HEALTH AND SAFETY PLAN FOR SUPPLEMENTAL ASSESSMENT UNDERGROUND  
STORAGE TANK SITE 18 (UST18) WITH TRANSMITTAL NAS PENSACOLA FL  
7/11/2005  
TETRA TECH



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0001

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July 11, 2005

Project Number G00005

Commander  
Southern Division  
Naval Facilities Engineering Command  
ATTN: Mr. Bill Hill, ES 31  
Remedial Project Manager  
2155 Eagle Drive  
North Charleston, South Carolina 29406

Reference: Clean Contract No. N62467-04-D-0055  
Contract Task Order No. 00005

**Subject: Final Health and Safety Plan for Supplemental Assessment for Underground Storage Tank Site 18, Naval Air Station Pensacola, Pensacola, Florida**

Dear Mr. Hill:

Tetra Tech NUS is pleased to submit the final Health and Safety Plan for the Supplemental Assessment for Underground Storage Tank (UST) Site 18, Naval Air Station (NAS) Pensacola, Pensacola, Florida. This document was completed to support the work plan sent under separate cover and the ongoing assessment activities at Site 18. Comments are not expected on this document.

If you have any questions, please call me at (850) 385-9899.

Sincerely yours,

Gerald Walker, P.G.  
Project Manager

GAW/gaw

Enclosure

c: Greg Campbell, NASP PWC  
Debbie Wroblewski (Cover Letter Only)  
Mark Perry/file (unbound)  
Tallahassee file CTO 00005

Bcc: Gerry Walker  
Tallahassee Library

**Health and Safety Plan**  
**Supplemental Assessment**  
**for**  
**UST Site 18**

for

**Naval Air Station Pensacola**  
Pensacola, Florida



**Southern Division**  
**Naval Facilities Engineering Command**  
Contract No. N62467-04-D-0055  
Contract Task Order 0005

July 2005



**HEALTH AND SAFETY PLAN  
SUPPLEMENTAL ASSESSMENT  
FOR UST SITE 18  
FOR  
NAVAL AIR STATION PENSACOLA  
PENSACOLA, FLORIDA**

**COMPREHENSIVE LONG-TERM  
ENVIRONMENTAL ACTION-NAVY (CLEAN) CONTRACT**

**Submitted to:  
Southern Division  
Naval Facilities Engineering Command  
2155 Eagle Drive  
North Charleston, South Carolina 29406**

**Submitted by:  
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**CONTRACT NUMBER N62467-04-D-0055  
CONTRACT TASK ORDER 0005**

**JUNE 2005**

**PREPARED UNDER THE  
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CLEAN HEALTH & SAFETY MANAGER  
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## **1.0 INTRODUCTION**

This Health and Safety Plan (HASP) has been written to encompass activities associated with a Supplemental Assessment at UST Site 18. The objective of this project is to determine the extent of free product and locations of possible source areas within Site 18 on the Naval Air Station Pensacola (NAS Pensacola), Pensacola, Florida as part of Contract Task Order (CTO) 0005. This HASP is part of an overall effort conducted under Comprehensive Long-Term Environmental Action Navy (CLEAN IV) administered through the U.S. Navy Southern Division Naval Facilities Engineering Command (NAVFAC), as defined under Contract Number N62467-94-D-0888. In addition to the HASP, a copy of the Tetra Tech NUS, Inc. (TtNUS) Environmental Health and Safety Guidance Manual must be present at the site during the performance of site activities. The Guidance Manual provides detailed information pertaining to the HASP, as well as TtNUS Standard Operating Procedures (SOP's). Both documents must be present at the site to comply with the requirements stipulated in the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work and site. The HASP will be modified if new information becomes available. Changes to the HASP will be made by the Project Health & Safety Officer (PHSO) and approved by the TtNUS Health and Safety Manager (HSM) and the Task Order Manager (TOM). The TOM will notify affected personnel of changes.

The elements of this HASP are in compliance with the requirements established by OSHA 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response" (HAZWOPER), and sections of 29 CFR 1926, "Safety and Health Regulations for Construction". The information contained in this plan, as well as policies on conducting onsite operations, have been obtained from the TtNUS Health and Safety Program.

### **1.1 KEY PROJECT PERSONNEL AND ORGANIZATION**

This section defines responsibility for site safety and health for TtNUS and subcontractor employees engaged in onsite activities. Personnel assigned to these positions will exercise the primary responsibility for onsite health and safety. These persons will be the primary points of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

- The TtNUS TOM is responsible for the overall direction of health and safety for this project.

- The PHSO is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:
  - i. Providing information regarding site contaminants and physical hazards associated with the site.
  - ii. Establishing air monitoring and decontamination procedures.
  - iii. Assigning personal protective equipment based on task and potential hazards.
  - iv. Determining emergency response procedures and emergency contacts.
  - v. Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.
  - vi. Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
  - vii. Modify this HASP, as it becomes necessary.
- The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed SSO. The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
- The SSO supports site activities by advising the FOL on the aspects of health and safety on-site. These duties may include:
  - i. Coordinates health and safety activities with the FOL.
  - ii. Selects, applies, inspects, and maintains personal protective equipment.
  - iii. Establishes work zones and control points in areas of operation.
  - iv. Implements air monitoring program for onsite activities.
  - v. Verifies training and medical clearance of onsite personnel status in relation to site activities.
  - vi. Implements Hazard Communication, Respiratory Protection Programs, and other associated health and safety programs as they may apply to site activities.
  - vii. Coordinates emergency services.
  - viii. Provides site-specific training for onsite personnel.
  - ix. Investigates accidents and injuries (see Attachment I - Illness/Injury Procedure and Report Form)
  - x. Provides input to the PHSO regarding the need to modify, this HASP, or applicable health and safety associated documents as per site-specific requirements.
- Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the TtNUS CLEAN HSM.

Note: In some cases one person may be designated responsibilities for more than one position. For example, at NAS Pensacola the FOL may also be responsible for SSO duties. This action will be performed only as credentials, experience, and availability permits.

## 1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: Naval Air Station Pensacola Address: Pensacola, Florida

Navy Remedial Project Manager: Byas Glover Phone Number: (843) 820-5651

Navy Environmental Coordinator: Greg Campbell Phone Number: (850) 452-4611 ext. 103

**Purpose of Site Visit:** This activity is divided into a multi-task operation (see Section 4.0), including soil boring (DPT), multimedia sampling, and other related activities.

Proposed Dates of Work: June 2005 until completion

### **Project Team:**

#### **TtNUS Personnel:**

Gerald Walker

TBD

Matthew M. Soltis, CIH, CSP

James K. Laffey

TBD

#### **Discipline/Tasks Assigned:**

Task Order Manager (TOM)

Field Operations Leader (FOL)

CLEAN Health and Safety Manager (HSM)

Project Health and Safety Officer (PHSO)

Site Safety Officer (SSO)

#### **Non-TtNUS Personnel**

TBD

TBD

#### **Affiliation/Discipline/Tasks Assigned**

DPT Subcontractor(s)

Hazard Assessments (for purposes of 29 CFR 1910.132) and HASP preparation conducted by:  
James K. Laffey

TBD - To be determined

## **2.0 EMERGENCY ACTION PLAN**

### **2.1 INTRODUCTION**

This section is part of a planning effort to direct and guide field personnel in the event of an emergency. Site activities will be coordinated with NAS Pensacola fire protection and emergency services prior to commencement. In the event of an emergency, which cannot be mitigated using onsite resources, personnel will evacuate to a safe place of refuge and the FOL will call 911 and report the emergency. Site personnel may transport ill workers or those who have non-serious injuries to medical facilities, provided that such transport can be done safely. The emergency response agencies listed in this plan are capable of providing the most effective response, and as such, will be designated as the primary responders. These agencies are located within a reasonable distance from the area of site operations, which ensures adequate emergency response time. NAS Pensacola Emergency Dispatch will be notified anytime outside response agencies are contacted. This Emergency Action Plan conforms to the requirements of 29 CFR 1910.38(a), as allowed in 29 CFR 1910.120(l)(1)(ii).

TtNUS will, through necessary services, include initial response measures for incidents such as:

- Initial fire-fighting support and prevention
- Initial spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Provision of initial medical support for injury/illness requiring only first-aid level support
- Provision of site control and security measures as necessary

### **2.2 EMERGENCY PLANNING**

Through the initial hazard/risk assessment effort, injury or illness resulting from exposure to chemical or physical hazards or fire are the most probable emergencies that can be encountered during site activities. To minimize and eliminate these potential emergency situations, pre-emergency planning activities associated with this project include the following. The SSO and/or the FOL are responsible for:

- Coordinating response actions with NAS Pensacola Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures.
- Establishing and maintaining information at the project staging area (Support Zone) for easy access in the event of an emergency. This information includes the following:



- Chemical Inventory (for substances used onsite), with Material Safety Data Sheets.
  - Onsite personnel medical records (medical data sheets).
  - A logbook identifying personnel onsite each day.
  - Emergency notification phone numbers in site vehicles
- Identifying a chain of command for emergency action.
  - Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.

It is the responsibility of the TtNUS FOL to ensure that this information is available and present at the site.

## **2.3 EMERGENCY RECOGNITION AND PREVENTION**

### **2.3.1 Recognition**

Foreseeable emergency situations that may be encountered during site activities will generally be recognizable by visual observation. A clear knowledge of the signs and symptoms of overexposure to contaminants of concern may alert personnel of the potential hazards concerning themselves or their fellow workers. These potential hazards, the activities with which they have been associated, and the recommended control methods are discussed in detail in sections 5.0 and 6.0 of this document. Additionally, early recognition will be supported by periodic site surveys to eliminate any conditions that may predispose site personnel or properties to an emergency. The FOL and the SSO will constitute the site evaluation committee responsible for these periodic surveys. Site surveys will be conducted at least once a week during the initiation of this effort.

The above actions will provide early recognition for potential emergency situations. Should an incident take place, TtNUS will take defensive and offensive measures to control these situations. However, if the FOL and/or the SSO determine that an incident has progressed to a serious emergency situation, TtNUS will withdraw, and notify the appropriate response agencies.

### **2.3.2 Prevention**

TtNUS and subcontractor personnel will minimize the potential for emergencies by ensuring compliance with the HASP, the Health and Safety Guidance Manual, applicable OSHA regulations, and through periodic site surveys of work areas.

## **2.4 SAFE DISTANCES AND PLACES OF REFUGE**

In the event that the site must be evacuated, personnel will immediately stop activities and report to the FOL at the place of safe refuge. Safe places of refuge will be determined prior to commencement of site activities and will be conveyed to personnel as part of the daily safety meeting conducted each morning. Upon reporting to the refuge location, personnel will remain there until directed otherwise by the TtNUS FOL. The FOL or the SSO will take a head count at this location to confirm the location of site personnel. The site logbook will be used to take the head count. Places of refuge will ideally be selected which offer a point for communication purposes should this be required.

## **2.5 EVACUATION ROUTES AND PROCEDURES**

Once an evacuation is initiated, personnel will proceed immediately to the designated place of refuge, unless doing so would further jeopardize the welfare of workers. In such an event, personnel will proceed to a designated alternate location (to be identified) and remain there until further notification from the FOL. The use of these locations as assembly points provides communication and a direction point for emergency services, should they be needed.

Evacuation procedures will be discussed prior to the initiation of any work at the site. This shall include identifying primary and secondary evacuation routes and assembly points. Evacuation routes from the site are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) will influence the designation of evacuation routes. As a result, assembly points at NAS Pensacola will be selected, and in the event of an emergency, field personnel will proceed to these points by the most direct route possible without further endangering themselves.

## **2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES**

Since TtNUS personnel will not always be working in the proximity of each other, hand signals, voice commands, air horns, and/or two-way radios may comprise the mechanisms to alert site personnel of an emergency.

If an incident occurs, site personnel will initiate the following procedures:

- Initiate incident alerting procedures (if needed) verbally, by air horn, or using two-way radios.
- Evacuate non-essential personnel.
- Initiate initial response procedures.
- Describe to the FOL (who will serve as the Incident Commander) what has occurred in as much detail as possible.

In the event that site personnel cannot control the incident through offensive and/or defensive measures, the FOL and/or the SSO will enact emergency notification procedure to secure additional outside assistance in the following manner:

- Call 911 for outside emergency service and report the emergency to the NAS Pensacola Emergency Dispatch (See Table 2-1)
- Give the emergency operator the location of the emergency and a brief description of what has occurred.
- Stay on the phone follow the instructions given by the operator
- The appropriate agency will be notified and dispatched

If an incident occurs at outside of our designated operating areas impacting field personnel, the following procedures are to be initiated:

- Initiate an evacuation (if needed) by voice commands, hand signals, air horns, or two-way radio.
- Call Navy On-Site Representative
- Proceed to the assembly points as directed by NAS Pensacola or other Navy personnel.

## **2.7 EMERGENCY CONTACTS**

Prior to performing work at the site, personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an incident. A mobile phone shall be available at the sites. Table 2-1 provides a list of emergency contacts and their corresponding telephone numbers. These numbers will be used for the sites to be visited during this project. This table must be posted at the sites where it is readily available to site personnel.

**TABLE 2-1**  
**EMERGENCY CONTACTS**  
**NAS PENSACOLA**

AGENCY	TELEPHONE
EMERGENCY (outside Police, Fire, and Ambulance Services)	<b>911</b>
NAS Pensacola - Emergency Dispatch	(850) 452-3333
Navy Engineer-in-Charge Byas Glover	(843) 820-5651
Facility Point of Contact Greg Campbell	(850) 452-4611 ext 103
Navy Hospital	(850) 505-6600
Baptist Hospital	(850) 469-2313
Poison Control Center	(800) 222-1222
Florida Game and Fresh Water Fish Commission Northwest Region	(850) 265-3676
WorkCare	(800) 229-3674
TtNUS Tallahassee Office and Task Order Manager (Gerry Walker)	(850) 385-9899
CLEAN Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
TtNUS Human Resources Manager Marilyn Duffy	(412) 921-8475
TtNUS Project Health and Safety Officer James K. Laffey	(412) 921-8678

## 2.8 ROUTE TO HOSPITALS

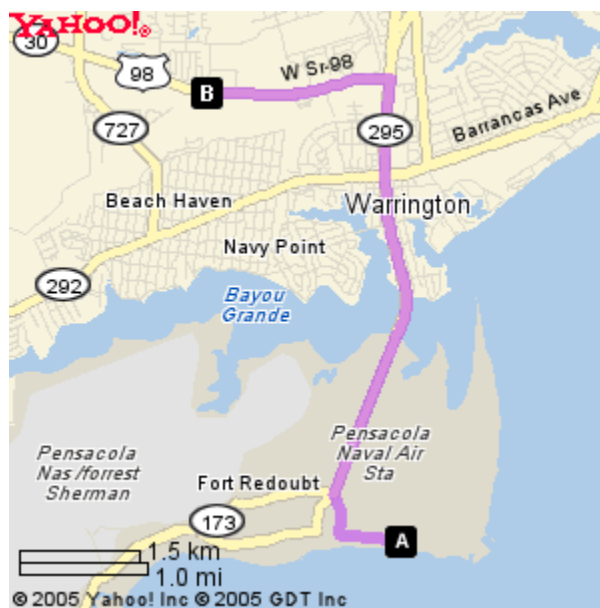
Two hospitals could potentially be used during this project depending on the circumstances. For emergency situations the Naval Hospital Pensacola (NHP) should be utilized. The hospital is closer to the site and is fully prepared to accept chemically contaminated patients. Baptist Hospital will be used for non-emergency care services. Routes and directions to these hospitals are provided below.

Navy Hospital  
6000 W. Highway 98  
Pensacola, Florida 32512  
(850) 505-6600

Directions to the Navy Hospital from the site are as follows:

- A** Proceed out of Main Gate (Navy Blvd) heading north to US Highway 98. Turn left (heading west) on US 98 and proceed approximately 1 mile. Hospital will be on the right (Building 2268). **B**

**Figure 2-1**  
**Route to Naval Hospital Pensacola**



Baptist Hospital  
1000 West Moreno Blvd.  
Pensacola, FL 32508  
(850-469-2313)

Directions to this Hospital from the Main Gate of NAS Pensacola are:

**A** Proceed out of Main Gate (Navy Blvd) heading north to Hwy 292. Turn right (heading east) on Hwy 292 until it turns into Garden Street (approx. 3 miles). Take Garden Street to intersection with "E" Street. Turn left onto "E" Street and proceed approximately 1 mile to Hospital on left. **B**

**Figure 2-1-1**  
**Route to Baptist Hospital**



## **2.9 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT**

During any site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will be postponed if the incident warrants immediate evacuation. However, it is unlikely that an evacuation would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

TtNUS personnel will perform removal of personnel from emergency situations and may provide initial medical support for injury/illnesses requiring only first-aid level support. Medical attention above that level will require assistance and support from the designated emergency response agencies. **If the emergency involves personnel exposures to chemicals, follow the steps provided in Figure 2-2.**

## **2.10 INJURY/ILLNESS REPORTING**

If any TtNUS personnel are injured or develop an illness as a result of working on site, the TtNUS "Injury/Illness Procedure" (Attachment I) must be followed. Following this procedure is necessary for documenting the information obtained at the time of the incident. Also, as soon as possible Navy contact Greg Campbell must be informed of any incident or accident that requires medical attention.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets filed onsite (See Attachment II). If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel.

## **FIGURE 2-2 EMERGENCY RESPONSE PROTOCOL**

The purpose of this protocol is to provide guidance for the medical management of injury situations.

In the event of a personnel injury or accident:

- Rescue, when necessary, employing proper equipment and methods.
- Give attention to emergency health problems -- breathing, cardiac function, bleeding, and shock.
- Transfer the victim to the medical facility designated in this HASP by suitable and appropriate conveyance (i.e. ambulance for serious events)
- Obtain as much exposure history as possible (a Potential Exposure report is attached).
- If the injured person is a Tetra Tech NUS employee, call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the WorkCare physician. WorkCare will contact the medical facility and request specific testing which may be appropriate. WorkCare physicians will monitor the care of the victim. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call WorkCare at 1-800-455-6155 and enter Extension 109 or follow the voice prompt for after hours and weekend notification and be prepared to provide:
  - Any known information about the nature of the injury.
  - As much of the exposure history as was feasible to determine in the time allowed.
  - Name and phone number of the medical facility to which the victim(s) has/have been taken.
  - Name(s) of the involved Tetra Tech NUS, Inc. employee(s).
  - Name and phone number of an informed site officer who will be responsible for further investigations.
  - Fax appropriate information to WorkCare at (714) 456-2154.
    - Contact Corporate Health and Safety Department (Matt Soltis) and Human Resources Manager (Marilyn Duffy) at 1-800-245-2730.

As data is gathered and the scenario becomes more clearly defined, this information should be forwarded to WorkCare. WorkCare will compile the results of the data and provide a summary report of the incident. A copy of this report will be placed in each victim's medical file in addition to being distributed to appropriately designated company officials.

Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. A personalized letter describing the individual findings/results will accompany this generalized summary. A copy of the personal letter will be filed in the continuing medical file maintained by WorkCare.



**FIGURE 2-2 (continued)**  
**POTENTIAL EXPOSURE REPORT**

Name: \_\_\_\_\_ Date of Exposure: \_\_\_\_\_

Social Security No.: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_

Client Contact: \_\_\_\_\_ Phone No.: \_\_\_\_\_

Company Name: \_\_\_\_\_

**I. Exposing Agent**

Name of Product or Chemicals (if known): \_\_\_\_\_

Characteristics (if the name is not known)

Solid      Liquid      Gas      Fume      Mist      Vapor

**II. Dose Determinants**

What was individual doing? \_\_\_\_\_

How long did individual work in area before signs/symptoms developed? \_\_\_\_\_

Was protective gear being used? If yes, what was the PPE? \_\_\_\_\_

Was there skin contact? \_\_\_\_\_

Was the exposing agent inhaled? \_\_\_\_\_

Were other persons exposed? If yes, did they experience symptoms? \_\_\_\_\_

**III. Signs and Symptoms** (check off appropriate symptoms)

**Immediately With Exposure:**

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Nausea / Vomiting

Dizziness

Weakness

**Delayed Symptoms:**

Weakness

Nausea / Vomiting

Shortness of Breath

Cough

Loss of Appetite

Abdominal Pain

Headache

Numbness / Tingling

**IV. Present Status of Symptoms** (check off appropriate symptoms)

Burning of eyes, nose, or throat

Tearing

Headache

Cough

Shortness of Breath

Chest Tightness / Pressure

Cyanosis

Nausea / Vomiting

Dizziness

Weakness

Loss of Appetite

Abdominal Pain

Numbness / Tingling

Have symptoms: (please check off appropriate response and give duration of symptoms)

Improved: \_\_\_\_\_ Worsened: \_\_\_\_\_ Remained Unchanged: \_\_\_\_\_

**V. Treatment of Symptoms** (check off appropriate response)

None: \_\_\_\_\_ Self-Medicating: \_\_\_\_\_ Physician Treated: \_\_\_\_\_

### **3.0 SITE BACKGROUND**

#### **3.1 NAS PENSACOLA**

NAS Pensacola is approximately 5,800 acres and is located on a peninsula bounded on the east and south by Pensacola Bay and Big Lagoon and on the north by Bayou Grande.

##### **3.1.1 UST 18**

UST Site 18 is located on NAS Pensacola in Escambia County, Florida, and occupies approximately 900 feet by 2,300 feet of open land along the southwestern border of Forrest Sherman Field. The site is bordered on the east by aircraft Runway 19, to the north by a paved taxiway, to the west by scattered brush and woods, and to the south by an open field.

Between 1955 and 1997, the UST 18 area was used to train fire fighters for aircraft crash responses, using available fuel as a combustion source. Historically, during training exercises, approximately 30 to 50 gallons of fuel were poured into unlined pits or onto various pieces of equipment, and then ignited to simulate aircraft crashes. The northernmost pit, which was lined and filled with water, contained a mock aircraft cockpit. Several other burn pits contained miscellaneous pieces of equipment, including a fuel trailer, various airplane parts, and metal and non-metallic debris of unknown, but presumably of aircraft origin. However, the district fire chief reported that up to 700 gallons of fuel may have been used per event. Most recently, only the northernmost pit was used for fire training. Fire training ceased at UST 18 in May 1997.

A contamination assessment followed by in-situ soil land farming was performed at UST Site 18. Contaminated groundwater remains at the site. Subsequent groundwater monitoring has shown elevated contaminant levels in the groundwater. Injection of oxygen releasing compound (ORC) was conducted to assess its effectiveness in reducing contaminant levels in groundwater. Following the completion of the ORC injection and 4 quarters of groundwater monitoring elevated concentrations of volatile organic compounds (VOCs), Poly Aromatic Hydrocarbons (PAHs), and Total Recoverable Petroleum Hydrocarbons continue to exceed the Florida Groundwater cleanup Target levels and concentrations of VOCs also exceed the Florida Department of Environmental Protection's (FDEP) Natural Attenuation Default Criteria. In addition, free product was also detected in one of the monitoring wells indicating the potential for a continuing source at the site.

## 4.0 SCOPE OF WORK

The following is a list of activities that are covered in this HASP for the CTO 0005 project:

- Mobilization/demobilization
- Multi media sampling including:
  - Soil gas
  - Groundwater
  - Surface and sub-surface soil
- Monitoring Well installation and development
- Soil boring using Direct Push Technology (DPT) and hand augering techniques
- Decontamination of sampling equipment
- IDW management

The above listing represents a summarization of the tasks as they may apply to the scope and application of this HASP. For more detailed description of the associated tasks, refer to the Sampling and Analysis Plan (SAP). Any tasks to be conducted outside of the elements listed here will be considered a change in scope requiring modification of this document. The TOM or a designated representative will submit requested modifications to this document to the HSM.

## **5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION**

Table 5-1 of this section serves as the primary portion of the site-specific HASP which identifies the tasks that are to be performed as part of the scope of work. This table will be modified and incorporated into this document as new or additional tasks are performed at the site. The anticipated hazards, recommended control measures, air monitoring recommendations, required Personal Protective Equipment (PPE), and decontamination measures for each site task are discussed in detail. This table and the associated control measures shall be changed, if the scope of work, contaminants of concern or other conditions change.

Through using the table, site personnel can determine which hazards are associated with each task and at each site, and what associated control measures are necessary to minimize potential exposure or injuries related to those hazards. The table also assists field team members in determining which PPE and decontamination procedures to use based on proper air monitoring techniques and site-specific conditions.

A Health and Safety Guidance Manual accompanies this table and HASP. The manual is designed to further explain supporting programs and elements for other site-specific aspects as required by 29 CFR 1910.120. The Guidance Manual should be referenced for additional information regarding air monitoring instrumentation, decontamination activities, emergency response, hazard assessments, hazard communication and hearing conservation programs, medical surveillance, PPE, respiratory protection, site control measures, standard work practices, and training requirements. Many of Tetra Tech NUS' SOPs are also provided in this Guidance Manual.

Safe Work Permits issued for Exclusion Zone activities (See Section 9.4) will use elements defined in Table 5-1 as it's primary reference. The FOL and/or the SSO completing the Safe Work Permit will add additional site-specific information. In situations where the Safe Work Permit is more conservative than the direction provided in Table 5-1 due to the incorporation of site-specific elements, the Safe Work Permit will be followed.

### **5.1 GENERAL SAFE WORK PRACTICES**

In addition to the task-specific work practices identified on Table 5-1, the following safe work practices will be observed when conducting work involving known and unknown site hazards. These safe work practices establish a pattern of general precautions and measures for reducing risks associated with hazardous site operations.

- Refrain from eating, drinking, chewing gum or tobacco, taking medication, or smoking in contaminated or potentially contaminated areas or where the possibility for the transfer of contamination exists.
- Wash hands and face thoroughly upon leaving a contaminated or suspected contaminated area. A thorough shower and washing must be conducted as soon as possible if excessive skin contamination occurs.
- Avoid contact with potentially contaminated substances by walking around puddles, pools, mud, or other such areas. Avoid, whenever possible, kneeling on the ground or leaning or sitting on equipment. Do not place monitoring equipment on potentially contaminated surfaces.
- Be familiar with and adhere to the instructions in the site-specific HASP.
- Be aware of the location of the nearest telephone and emergency telephone numbers. See Section 2.0, Table 2-1.
- Attend briefings on anticipated hazards, equipment requirements, Safe Work Permits, emergency procedures, and communication methods before going on site.
- Plan and mark entrance, exit, and emergency escape routes. See Section 2.0.
- Rehearse unfamiliar operations prior to implementation.
- Maintain visual contact with each other and with other on-site team members by remaining in close proximity in order to assist each other in case of emergency.
- Establish appropriate Safety Zones including Support, Contamination Reduction, and Exclusion Zones.
- Minimize the number of personnel and equipment in contaminated areas (such as the Exclusion Zone). Non-essential vehicles and equipment should remain within the Support Zone.
- Establish appropriate decontamination procedures for leaving the site.
- Immediately report injuries, illnesses, and unsafe conditions, practices, and equipment to the Site Safety Officer (SSO).
- Observe coworkers for signs of toxic exposure and heat or cold stress.
- Inform co-workers of potential symptoms of illness, such as headaches, dizziness, nausea, or blurred vision.

## 5.2 SOIL BORING SAFE WORK PRACTICES

The following safe work practices will be followed when working around DPT operations.

- Heavy equipment (DPT) will be inspected by a Competent Person (the SSO or designee), prior to the acceptance of the equipment at the site and prior to the use of the equipment. Repairs or deficiencies identified will be corrected prior to use. The inspection will be accomplished using the Equipment Inspection Checklist provided in Attachment III. Inspection frequencies will be once every 10-day shift or following repairs.
- Identify underground utilities and buried structures before intrusive operations are performed. Use the Utility Locating and Excavation Clearance Standard Operating Procedure provided in Attachment III.
- The DPT assistant will establish an equipment staging and lay down area plan. The purpose of this is to keep the work area clear of clutter and slips, trips, and fall hazards.
- Potentially contaminated tooling will be wrapped in polyethylene sheeting for storage and transport to the centrally located decontamination unit.
- One employee will be designated by the DPT operator as the individual with primary responsibility for immediate activation of emergency stop devices in the event of an emergency.
- Prior to engaging boring equipment, the equipment operator will ensure workers are clear of moving parts and will verbally alert workers in the vicinity of moving equipment.
- Minimize contact to the extent possible with contaminated tooling and environmental media.
- Support functions (sampling and screening stations) will be maintained a minimum distance from the DPT rig equal to the height of the mast plus five feet to remove these activities from within physical hazard boundaries.
- Only qualified operators and knowledgeable ground crew personnel will participate in the operation of the DPT rig.
- In order to minimize contact with potentially contaminated tooling and media and to minimize lifting hazards, multiple personnel should move auger flights and other heavy tooling.

- Only personnel absolutely essential to the work activity will be allowed in the exclusion zone. Site visitors will be escorted.
- Equipment used within the exclusion zone will undergo a complete decontamination and evaluation by the SSO to determine cleanliness prior to moving to the next location, exiting the site, or prior to down time for maintenance.
- Motorized equipment will be fueled prior to the commencement of the day's activities. During fueling operations, equipment will be shut down and bonded to the fuel provider.
- When not in use DPT rigs will be shut down, and emergency brakes set. DPT rigs will have their wheels chocked to assist in controlling movement.

Areas subjected to subsurface investigative methods will be restored to equal or better condition than original to remove any contamination brought to the surface and to remove any physical hazards. In situations where these hazards cannot be removed these areas will be barricaded to minimize the impact on field crews working in the area.

**TABLE 5-1**  
**TASKS/HAZARDS/CONTROL MEASURES**  
**NAVAL AIR STATION PENSACOLA, FLORIDA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment ( <i>Items in italics are deemed optional as conditions or the FOL or SSO require.</i> )	Decontamination Procedures
Mobilization/ Demobilization	<p><i>Physical hazards:</i></p> <p>1) Lifting (strain/muscle pulls) 2) Pinches and compressions 3) Slip, trips, and falls 4) Heavy equipment hazards (rotating equipment, hydraulic lines, etc.) 5) Vehicular and foot traffic 6) Ambient temperature extremes (heat stress)</p> <p><i>Natural hazards:</i></p> <p>7) Insect/animal bites and stings, poisonous plants, etc.</p>	<p>1) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques. 2) Keep any machine guarding in place. Avoid moving parts. Use tools or equipment where necessary to avoid contacting pinch points. 3) Preview work locations for unstable/uneven terrain. 4) Equipment will be</p> <ul style="list-style-type: none"><li>- Inspected in accordance with OSHA and manufacturer's design.</li><li>- Operated by knowledgeable operators and ground crew.</li></ul> <p>5) Traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none"><li>- Establish safe zones of approach (i.e. Boom + 3 feet).</li><li>- DPT rig and other self-propelled equipment shall be equipped with movement warning systems.</li><li>- Activities are to be conducted consistent with the Base requirements.</li></ul> <p>6) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat stress concerns is provided in the Health and Safety Guidance Manual.</p> <p>7) Avoid nesting areas, use repellents. Report potential hazards to the SSO. Follow guidance presented in Section 4 of the Health and Safety Guidance Manual.</p>	Not required	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"><li>- Standard field attire (Sleeved shirt; long pants)</li><li>- Steel toe safety shoes</li><li>- <i>Safety glasses</i></li><li>- <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i></li><li>- <i>Reflective vest for high traffic areas</i></li><li>- <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i></li></ul>	Not required
IDW management and moving IDW drums to storage areas	<p><i>Chemical hazards:</i></p> <p>1) Primary types of contaminants include VOCs and SVOCs associated with petroleum products including diesel fuel. Based on historical analytical data, none of the VOCs/SVOCs of concern (benzene, chlorobenzene, dichlorobenzene, ethylbenzene, MTBE, naphthalene, styrene, toluene and xylene) are at concentrations that would pose an inhalation hazard to site personnel.</p> <p>See Table 6-1 for more information on the chemicals of concern.</p> <p>2) Transfer of contamination into clean areas</p> <p><i>Physical hazards:</i></p> <p>3) Noise in excess of 85 dBA 4) Lifting (strain/muscle pulls) 5) Pinches and compressions 6) Slip, trips, and falls 7) Vehicular and foot traffic 8) Ambient temperature extremes (heat stress)</p> <p><i>Natural hazards:</i></p> <p>9) <i>Insect/animal bites and stings, poisonous plants, etc.</i></p>	<p>1) Employ real-time monitoring instrumentation, action levels, and identify PPE to control exposures to potentially contaminated media (e.g. air, water, soils).</p> <p>2) Decontaminate equipment and supplies, if they become contaminated, between locations and prior to leaving the site.</p> <p>3) When working near heavy equipment, use hearing protection.</p> <p>4) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>5) Keep any machine guarding in place. Avoid moving parts. Use tools or equipment where necessary to avoid contacting pinch points.</p> <p>6) Preview work locations for unstable/uneven terrain.</p> <p>7) Traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none"><li>- Establish safe zones of approach (i.e. Boom + 3 feet).</li><li>- Self-propelled equipment shall be equipped with movement warning systems.</li><li>- Activities are to be conducted consistent with the Base requirements.</li></ul> <p>8) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat stress concerns is provided in the Health and Safety Guidance Manual.</p> <p>9) Avoid nesting areas, use repellents. Report potential hazards to the SSO. Follow guidance presented in Section 4 of the Health and Safety Guidance Manual.</p>	<p>It is not anticipated that potential contaminant concentrations at IDW management locations will present an inhalation hazard.</p> <p>A direct reading Photoionization Detector (PID), with at least a 10.6 eV lamp, will be used to screen samples and to detect the presence of any potential volatile organics. Source monitoring of the borehole will be conducted at regular intervals to be determined by the SSO. Positive sustained results at a source or downwind location(s) which may impact operations crew will require the following actions:</p> <ul style="list-style-type: none"><li>- Monitor the breathing zone of at-risk and downwind employees. Any sustained readings (greater than 1 minute in duration) above background in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to report to an unaffected area.</li><li>- Work may only resume if airborne readings in worker breathing zone return to below background levels. If elevated readings in worker breathing zone persist, the PHSO and HSM will be contacted to determine necessary actions and levels of protection.</li></ul> <p>Site contaminants may adhere to or be part of airborne dusts or particulates generated during site activities. Generation of dusts should be minimized to avoid inhalation of contaminated dusts or particulates. Evaluation of dust concentrations will be performed by observing work conditions for visible dust clouds. Potential exposure to contaminated dust will be controlled using water suppression, by avoiding dust plumes, or evacuating the operation area until dust subsides, or area wetting to control dusts are completed.</p> <p>This action level has been selected based on the fact that no VOCs should be present in the worker breathing zones based on existing analytical data from this site. Any sustained elevated readings should be viewed as a potential hazard until the source can be determined.</p>	<p>Level D protection will be utilized for the initiation of sampling activities.</p> <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"><li>- Standard field attire (Sleeved shirt; long pants)</li><li>- Nitrile or cotton/leather work gloves with surgical style inner gloves</li><li>- Steel toe safety shoes</li><li>- Safety glasses</li><li>- <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i></li><li>- <i>Reflective vest for high traffic areas</i></li><li>- <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential for soiling work attire exists.</i></li><li>- <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i></li></ul>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable). The decon function will take place at an area adjacent to the site activities. This procedure will consist of:</p> <ul style="list-style-type: none"><li>- Equipment drop</li><li>- Soap/water wash and rinse of outer boots and gloves, as applicable</li><li>- Soap/water wash and rinse of the outer splash suit, as applicable</li><li>- Disposable PPE will be removed and bagged.</li></ul>



**TABLE 5-1**  
**TASKS/HAZARDS/CONTROL MEASURES**  
**NAVAL AIR STATION PENSACOLA, FLORIDA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment ( <i>Items in italics are deemed optional as conditions or the FOL or SSO require.</i> )	Decontamination Procedures
Soil borings using Direct-Push Technology [Geoprobe®] and hand auger methods.	<p><i>Chemical Hazards</i></p> <p>1) Primary types of contaminants include VOCs and SVOCs associated with petroleum products including diesel fuel. Based on historical analytical data, none of the VOCs/SVOCs of concern (benzene, chlorobenzene, dichlorobenzene, ethylbenzene, MTBE, naphthalene, styrene, toluene and xylene) are at concentrations that would pose an inhalation hazard to site personnel.</p> <p>Refer to Table 6-1 for additional information on site contaminants of concern.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p><i>Physical hazards</i></p> <p>3) Heavy equipment hazards (pinch/compression points, rotating equipment, hydraulic lines, etc.)</p> <p>4) Noise in excess of 85 dBA</p> <p>5) Energized systems (contact with underground or overhead utilities)</p> <p>6) Lifting (strain/muscle pulls)</p> <p>7) Slips, trips, and falls</p> <p>8) Vehicular and foot traffic</p> <p>9) Ambient temperature extremes (cold stress)</p> <p><i>Natural hazards</i></p> <p>10) Insect/animal bites and stings, poisonous plants, etc.</p> <p>11) Inclement weather</p>	<p>1) Use safe work practices and identified PPE to control exposures to potentially contaminated media (air, water, soils, etc.). Generation of dusts should be minimized. If airborne dusts are observed, area wetting methods may be used. If area wetting methods are not feasible, activities must be suspended until dust levels subside, or until an acceptable alternative control method can be selected.</p> <p>2) Decontaminate equipment and supplies between boreholes and prior to leaving the site.</p> <p>3) All equipment to be used will be</p> <ul style="list-style-type: none"><li>- Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600,.601,.602), and manufacturers design and documented as such using Equipment Inspection Sheet (see Attachment IV of this HASP).</li><li>- Operated by knowledgeable operators and ground crew.</li><li>- Repaired using only manufacturer approved parts and equipment.</li><li>- All personnel not directly supporting the DPT operation will remain at least the mast height plus 5 feet from the point of operation.</li><li>- All loose clothing/protective equipment will be secured to avoid possible entanglement.</li><li>- Hand signals will be established prior to the commencement of DPT activities.</li><li>- A remote sampling device must be used to sample near rotating tools.</li><li>- Work areas will be kept clear of clutter.</li><li>- All personnel will be instructed in the location and operation of the emergency shut off device(s) for DPT rigs (if applicable). This device will be tested initially (and then periodically) to insure its operational status.</li><li>- Areas will be inspected prior to the movement of DPT rigs and support vehicles to eliminate any physical hazards. This will be the responsibility of the FOL and/or SSO.</li></ul> <p>4) Hearing protection will be used during all subsurface activities using the DPT rig.</p> <p>5) All DPT activities must proceed in accordance with the TtNUS SOP “Utility Locating and Excavation Clearance” (see Attachment III of this HASP). All utility clearances must be obtained, in writing, prior to activities. Also, prior to any subsurface investigations, the locations of all underground utilities must be identified and marked. Overhead utilities must be identified per the SOP.</p> <p>6) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques.</p> <p>7) Preview work locations for unstable/uneven terrain.</p> <p>8) Traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none"><li>- Establish safe zones of approach. See Section 9 of the HASP for specific safety zones based on media being sampled.</li><li>- All equipment shall be equipped with movement warning systems.</li><li>- All activities are to be conducted consistent with the site requirements.</li></ul> <p>9) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding cold stress is provided in Section 4 of the Health and Safety Guidance Manual.</p> <p>10) Avoid nesting areas, use repellents. Wear appropriate clothing. Report potential hazards to the SSO. Follow guidance presented in Section 4 of the Health and Safety Guidance Manual.</p> <p>11) Suspend or terminate operations until directed otherwise by SSO.</p>	<p>As a precaution a Photoionization Detector (PID) with a 10.6 eV lamp or higher, or a Flameionization Detector (FID), will be used to screen the work area to detect the presence of VOCs. Source monitoring of the borehole will be conducted at regular intervals to be determined by the SSO. Positive sustained results at a source or downwind location(s) which may impact operations crew will require the following actions:</p> <ul style="list-style-type: none"><li>- Monitor the breathing zone of at-risk and downwind employees. Any sustained readings (greater than 1 minute in duration) above background in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to retreat to an unaffected area.</li><li>- Work may only resume if airborne readings in worker breathing zones return to below background. If elevated readings in worker breathing zone persist, the PHSO and HSM will be contacted to determine necessary actions and levels of protection.</li></ul> <p>Site contaminants may adhere to or be part of airborne dusts or particulates generated during site activities. Generation of dusts should be minimized to avoid inhalation of contaminated dusts or particulates. Evaluation of dust concentrations will be performed by observing work conditions for visible dust clouds. Potential exposure to contaminated dust will be controlled using water suppression, by avoiding dust plumes, or evacuating the operation area until dust subsides.</p> <p>This action level has been selected based on the fact that no VOCs should be present in the worker breathing zones based on existing analytical data from this site. Any sustained elevated readings should be viewed as a potential hazard until the source can be determined.</p>	<p>All subsurface operations are to be initiated in Level D protection. Level D protection constitutes the following minimum protection</p> <ul style="list-style-type: none"><li>- Standard field attire (Sleeved shirt; long pants)</li><li>- Steel toe safety shoes</li><li>- Safety glasses</li><li>- Hardhat</li><li>- Hearing protection during soil boring activities and for other high noise areas as directed by the SSO.</li><li>- Nitrile gloves or leather gloves with surgical style inner gloves</li><li>- <i>Reflective vest for traffic areas</i></li><li>- <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential exists for soiling work attire.</i></li></ul> <p><b>Note:</b> The Safe Work Permit(s) for this task (see Attachment V) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p><b>Personnel Decontamination</b> - Will consist of a soap/water wash and rinse for reusable protective equipment (e.g., gloves). This function will take place at an area adjacent to the DPT operations bordering the support zone.</p> <p>This decontamination procedure for Level D protection will consist of</p> <ul style="list-style-type: none"><li>- Equipment drop</li><li>- Soap/water wash and rinse of reusable outer gloves, as applicable</li><li>- Outer coveralls, boot covers, and/or outer glove removal</li><li>- Removal, segregation, and disposal of non-reusable PPE in bags/containers provided</li><li>- Wash hands and face, leave contamination reduction zone.</li></ul>

**TABLE 5-1**  
**TASKS/HAZARDS/CONTROL MEASURES**  
**NAVAL AIR STATION PENSACOLA, FLORIDA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO dictate.)</i>	Decontamination Procedures
Multimedia sampling including groundwater; surface and subsurface soil; and soil gas	<p><i>Chemical hazards:</i></p> <p>1) Primary types of contaminants include VOCs and SVOCs associated with petroleum products including diesel fuel. Based on historical analytical data, none of the VOCs/SVOCs of concern (benzene, chlorobenzene, dichlorobenzene, ethylbenzene, MTBE, naphthalene, styrene, toluene and xylene) are at concentrations that would pose an inhalation hazard to site personnel.</p> <p>Refer to Table 6-1 for additional information on site contaminants of concern.</p> <p>2) Transfer of contamination into clean areas</p> <p><i>Physical hazards:</i></p> <p>3) Lifting (strain/muscle pulls) 4) Slip, trips, and falls 5) Ambient temperature extremes (heat stress) 6) Vehicular and foot traffic</p> <p><i>Natural hazards:</i></p> <p>7) Insect/animal bites and stings, poisonous plants, etc.</p> <p>8) Inclement weather</p>	<p>1) Use real-time monitoring instrumentation, action levels, and identified PPE to control exposures to potentially contaminated media (air, water, etc.).</p> <p>2) Decontaminate equipment and supplies between sampling locations and prior to leaving the site.</p> <p>3) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques particularly when lifting or handling heavy or awkward objects (drums, sample coolers, etc.)</p> <p>4) Preview work locations for unstable/uneven terrain.</p> <p>5 Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding cold/heat stress concerns is available in the Health and Safety Guidance Manual.</p> <p>6) Traffic and equipment considerations are to include the following: - Establish safe zones of approach. - Activities are to be conducted consistent with the Base requirements. - If working near roadways or other traffic areas, wear high visibility vests.</p> <p>7) Avoid nesting areas, use repellents. Report potential hazards to the SSO. Follow guidance presented in Section 4 of the Health and Safety Guidance Manual.</p> <p>8) Suspend or terminate operations until directed otherwise by the SSO.</p>	<p><b>It is not anticipated that potential contaminant concentrations at outdoor sample locations will present an inhalation hazard.</b></p> <p>A direct reading Photoionization Detector (PID), with at least a 10.6 eV lamp, will be used to screen samples and to detect the presence of any potential volatile organics. Source monitoring of the monitoring well will be conducted at regular intervals to be determined by the SSO. Positive sustained results at a source or downwind location(s) which may impact operations crew will require the following actions:</p> <ul style="list-style-type: none"><li>- Monitor the breathing zone of at-risk and downwind employees. Any sustained readings (greater than 1 minute in duration) above background in the breathing zone of the at-risk employees requires site activities to be suspended and site personnel to report to an unaffected area. Sustained readings at any concentration will be reported to the PHSO/HSM so that additional guidance can be provided.</li><li>- Work may only resume if airborne readings in worker breathing zone return to below background levels. If elevated readings in worker breathing zone persist, the PHSO and HSM will be contacted to determine necessary actions and levels of protection.</li></ul> <p>This action level has been selected based on the fact that no VOCs should be present in the worker breathing zones based on existing analytical data from this site. Any sustained elevated readings should be viewed as a potential hazard until the source can be determined.</p>	<p>Level D protection will be utilized for the initiation of sampling activities.</p> <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none"><li>- Standard field attire (Sleeved shirt; long pants)</li><li>- Steel toe safety shoes</li><li>- Safety glasses</li><li>- Surgical style gloves (double-layered if necessary)</li><li>- Reflective vest for high traffic areas</li><li>- <i>Hardhat (when overhead hazards exists, or identified as a operation requirement)</i></li><li>- <i>Tyvek coveralls and disposable boot covers if surface contamination is present or if the potential for soiling work attire exists.</i></li><li>- <i>Hearing protection for high noise areas, or as directed on an operation by operation scenario.</i></li></ul> <p><b>Note:</b> The Safe Work Permit(s) for this task (see Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p><b>Personnel Decontamination</b> will consist of a removal and disposal of non-reusable PPE (gloves, coveralls, etc., as applicable). The decon function will take place at an area adjacent to the site activities. This procedure will consist of:</p> <ul style="list-style-type: none"><li>- Equipment drop</li><li>- Outer coveralls, boot covers, and/or outer glove removal (as applicable)</li><li>- Removal, segregation, and disposal of non-reusable PPE in bags/containers provided</li><li>- Soap/water wash and rinse of reusable PPE (e.g., hardhat) if potentially contaminated</li><li>- Wash hands and face, leave contamination reduction zone.</li></ul>

**TABLE 5-1**  
**TASKS/HAZARDS/CONTROL MEASURES**  
**NAVAL AIR STATION PENSACOLA, FLORIDA**

Tasks/Operation/ Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring	Personal Protective Equipment <i>(Items in italics are deemed optional as conditions or the FOL or SSO require.)</i>	Decontamination Procedures
Decontamination of Sampling and Heavy Equipment (DPT rig)	<p><i>Chemical hazards:</i></p> <p>1) Primary types of contaminants include VOCs and SVOCs associated with petroleum products including diesel fuel. Based on historical analytical data, none of the VOCs/SVOCs of concern (benzene, chlorobenzene, dichlorobenzene, ethylbenzene, MTBE, naphthalene, styrene, toluene and xylene) are at concentrations that would pose an inhalation hazard to site personnel.</p> <p>Refer to Table 6-1 for additional information on site contaminants of concern.</p> <p>2) Decontamination fluids - Liquinox (detergent), acetone or isopropanol</p> <p><i>Physical hazards:</i></p> <p>3) Lifting (strain/muscle pulls) 4) Noise in excess of 85 dBA 5) Flying projectiles 6) Vehicular and foot traffic 7) Ambient temperature extremes (heat stress) 8) Slips, trips, and falls</p> <p><i>Natural hazards:</i></p> <p>9) Inclement weather</p>	<p>1) and 2) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. Obtain manufacturer's MSDS for any decontamination fluids used onsite. These must be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS. Chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication section of the Health and Safety Guidance Manual (Section 5).</p> <p>3) Use multiple persons where necessary for lifting and handling sampling equipment for decontamination purposes.</p> <p>4) Wear hearing protection when operating pressure washer.</p> <p>5) Use eye and face protective equipment when operating pressure washer (if applicable). Other personnel must be restricted from the area.</p> <p>6) Traffic and equipment considerations are to include the following: - Establish safe zones of approach. - Self-propelled equipment shall be equipped with movement warning systems. - Activities are to be conducted consistent with the Base requirements.</p> <p>7) Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat stress concerns is provided in the Health and Safety Guidance Manual.</p> <p>8) Preview work locations for unstable/uneven terrain.</p> <p>9) Suspend or terminate operations until directed otherwise by SSO.</p>	<p>Use visual observation, and real-time monitoring instrumentation to ensure equipment has been properly cleaned of contamination and dried. After decontamination is completed, screen equipment with a PID. If any elevated readings (i.e., above background) are observed, perform decontamination again and re-screen. Repeat until no elevated PID readings are noted.</p>	<p>For Heavy Equipment that require the use of high pressure, steam cleaning procedures.</p> <p>Level D Minimum requirements - - Standard field attire (Sleeved shirt; long pants) - Steel toe safety shoes - Chemical resistant boot covers - Nitrile outer gloves - Safety glasses underneath a splash shield - Hearing protection (plugs or muffs) - <i>PVC Rainsuits or PE or PVC coated Tyvek</i></p> <p>For sampling equipment (trowels, MacroCore Samplers, bailers, etc.), the following PPE is required</p> <p>Note: Consult MSDS for PPE guidance. Otherwise, observe the following.</p> <p>Level D Minimum requirements - - Standard field attire (Sleeved shirt; long pants) - Safety shoes (Steel toe/shank) - Nitrile outer gloves - Safety glasses</p> <p>In the event of overspray of chemical decontamination fluids wear PVC Rain suits or PE or PVC coated Tyvek as necessary.</p>	<p><b>Personnel Decontamination</b> will consist of a soap/water wash and rinse for reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable). The decon function will take place at an area adjacent to the site activities. This procedure will consist of: - Equipment drop - Soap/water wash and rinse of outer boots and gloves, as applicable - Soap/water wash and rinse of the outer splash suit, as applicable - Disposable PPE will be removed and bagged.</p> <p><b>Equipment Decontamination</b> - Heavy equipment decontamination will take place at a centralized decontamination pad utilizing steam or pressure washers. Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. Site vehicles will have restricted access to exclusion zones, and have their wheels/tires sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the onsite activity.</p> <p><b>Sampling Equipment Decontamination</b></p> <p>Sampling equipment will be decontaminated as per the requirements in the Sampling and Analysis Plan and/or Work Plan.</p> <p>MSDS for any decon solutions (Alconox, isopropanol, etc.) will be obtained and used to determine proper handling / disposal methods and protective measures (PPE, first-aid, etc.).</p> <p>Equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving onsite and leaving the site. No equipment will be authorized access or exit without this evaluation.</p>

## **6.0 HAZARD ASSESSMENT**

The following section provides information regarding the chemical, physical, and natural hazards associated with the sites to be investigated and the activities that are to be conducted as part of the scope of work. Table 6-1, which is included as part of this HASP, provides various information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data. Section 6.1 provides general information regarding contaminants that may be present at the sites.

### **6.1 CHEMICAL HAZARDS**

The potential health hazards associated with work to be conducted at NAS Pensacola include inhalation, ingestion, and dermal contact of various contaminants that may be present in shallow and deep soils and groundwater. Based on the site history and prior sampling efforts, the contaminants of concern are related to petroleum products such as diesel fuel and include VOCs and SVOCs. The following have been identified as the primary contaminants of interest:

- Volatile Organic Compounds (VOCs), specifically benzene, dichlorobenzene, 1,2-dichloroethene, methyl-t-butyl ether (MTBE), naphthalene, styrene, toluene, xylene and ethylbenzene.
- Semi-Volatile Organic Compounds (SVOCs), including Total Petroleum Hydrocarbons (TPHs).

Table 6-1 provides information on the compounds and individual substances likely to be present at the site to be investigated. Included is information on the toxicological, chemical, and physical properties of these substances. It is anticipated that the greatest potential for exposure to site contaminants is during intrusive activities (soil boring, sampling, etc.). Exposure to these compounds is most likely to occur through ingestion and inhalation of contaminated soil or water, or hand-to-mouth contact during soil disturbance activities. For this reason, PPE and basic hygiene practices (washing face and hands before leaving site) will be extremely important. Inhalation exposure will be avoided by using appropriate PPE and engineering controls where necessary. Significant exposure via inhalation is not anticipated during the planned scope of work.

Specified control measures have been provided in Table 5-1 and the Safe Work Permit for this task (See Attachment V).

**TABLE 6-1**  
**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA**  
**NAVAL AIR STATION PENSACOLA**

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Chlorobenzene	108-90-7	PID: I.P. 9.07 eV, High response with PID and 10.2 eV lamp.  FID: Relative response ratio for FID detection is unknown, however, is considered to be detectable as this substance will burn.	Air sample using charcoal sorbent tube; carbon disulfide desorption with gas chromatography-flame ionization detector. Sampling and analytical protocol in accordance with NIOSH Method #1003	OSHA: 75 ppm NIOSH: 10 ppm IDLH: 1000 pp	Adequate - Odor threshold 1.3 ppm. Can use air-purifying respirator with organic vapor cartridge up to 500 ppm.  <b>Recommended glove:</b> Viton - >8.00 hrs PV Alcohol >8.00 hrs	<b>Boiling Pt:</b> 268°F; 131°C <b>Melting Pt:</b> -49°F; -45°C <b>Solubility:</b> 0.05% <b>Flash Pt:</b> 82°F; 28°C <b>LEL/LFL:</b> 1.3% <b>UEL/UFL:</b> 9.6% <b>Vapor Density:</b> 3.88 <b>Vapor Pressure:</b> 10 mmHg @ 72° F; 22°C <b>Specific Gravity:</b> 1.11 <b>Incompatibilities:</b> Strong oxidizers <b>Appearance and Odor:</b> Colorless liquid with an almond-like odor.	Regulated primarily because of it potential to cause sleepiness and incoordination. Irritating to the eyes, nose, and skin. Chronic exposure may cause liver, kidney, and lung damage.
Benzene	71-43-2	PID: I.P 9.24 eV, 100% response with PID and 10.2 eV lamp.  FID: 150% relative response ratio with FID.	Air sample using 2 mil Tedlar sample bags or charcoal tube with carbon disulfide desorption. Sampling and analytical protocol in accordance with NIOSH Method # 3700 or #1500 and OSHA 07.	OSHA: 1 ppm 5 ppm (STEL) <i>See 29 CFR 1910.1028</i>  ACGIH: 10 ppm NIOSH: 0.1 ppm  IDLH: 500 ppm	Inadequate - Odor threshold 1.4-120 ppm. The use of half-face air-purifying respirators with organic vapor cartridge up to 10 ppm is acceptable despite the inadequate warning properties, providing cartridges are changed at the beginning of each shift.  <b>Recommended gloves:</b> Butyl/neoprene blend - >8.00 hrs; Silver shield as a liner - >8.00 hrs; Viton - >8.00 hrs	<b>Boiling Pt:</b> 176°F; 80°C <b>Melting Pt:</b> 42°F; 5.5°C <b>Solubility:</b> 0.07% <b>Flash Pt:</b> 12°F; -11°C <b>LEL/LFL:</b> 1.2% <b>UEL/UFL:</b> 7.8% <b>Vapor Density:</b> 2.77 <b>Vapor Pressure:</b> 75 mmHg <b>Specific Gravity:</b> 0.88 <b>Incompatibilities:</b> Strong oxidizers, fluorides, perchlorates, and acids <b>Appearance and Odor:</b> Colorless to a light yellow liquid with an aromatic odor	Overexposure may result in irritation to the eyes, nose, throat, and respiratory system. CNS effects include giddiness, lightheadedness, headaches, staggered gait, fatigue, and lassitude and depression. Additional effects may include nausea, difficulty breathing, and intoxicification. Long duration exposures may result in respiratory collapse. May cause damage to the blood forming organs and may cause a form of cancer called leukemia. The ACGIH, IARC, and OSHA list benzene as a carcinogen.
Diesel Fuel No.2-D	Mixture	Components of this substance will be detected readily however no documentation exists as to the relative response ratio of either PID or FID.	Air sample using charcoal tube as a collection media; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with NIOSH Method #1550.	OSHA; NIOSH; ACGIH: 5 mg/m³ as mineral oil mist. In addition NIOSH and ACGIH establish 10 mg/m³ as a STEL.	Kerosene odor  <b>Recommended Air Purifying cartridges:</b> Organic vapor  <b>Recommended gloves:</b> Nitrile	<b>Boiling Pt:</b> <170-400°F; 77-204°C <b>Melting Pt:</b> Not available <b>Solubility:</b> Negligible <b>Flash Pt:</b> 125°F; 52°C <b>LEL/LFL:</b> 0.6% <b>UEL/UFL:</b> 7.5% <b>Vapor Density:</b> >5 <b>Vapor Pressure:</b> <1 mmHg @ 70°F; 21°C <b>Specific Gravity:</b> 0.86 <b>Incompatibilities:</b> strong oxidizers, halogens, and hypochlorites <b>Appearance and odor:</b> Colorless to amber with a kerosene odor	Prolonged or repeated exposures to this product may cause skin and eye irritation. Due to the defatting capabilities this exposure may lead to a dermatitis condition. High vapor concentrations are irritating to the eyes and respiratory tract. Exposure to high airborne concentrations may result in narcotic effects including dizziness, headaches, and anesthetic to unconsciousness. High concentrations in a confined space may adequately displace oxygen thereby resulting in suffocation.

**TABLE 6-1**  
**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA**  
**NAVAL AIR STATION PENSACOLA**

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Ethylbenzene	100-41-4	PID: I.P. 8.76, High response with PID and 10.2 eV lamp.  FID: 100% response with FID.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #07 or NIOSH Method #1501 Aromatic Hydrocarbon.	ACGIH; NIOSH: 100 ppm; 125 ppm STEL  OSHA: 100 ppm  IDLH: 800 ppm	Adequate - Can use air-purifying respirator with organic vapor cartridge up to 800 ppm.  <b>Recommended gloves:</b> Neoprene or nitrile w/ silver shield when potential for saturation; Teflon >3.00 hrs	<b>Boiling Pt:</b> 277°F; 136°C <b>Melting Pt:</b> -139°F; -95°C <b>Solubility:</b> 0.01% <b>Flash Pt:</b> 55°F; 13°C <b>LEL/LFL:</b> 1.0% <b>UEL/UFL:</b> 6.7% <b>Vapor Density:</b> 3.66 <b>Vapor Pressure:</b> 10 mmHg @ 79°F; 26°C <b>Specific Gravity:</b> 0.87 <b>Incompatibilities:</b> Strong oxidizers <b>Appearance and odor:</b> Colorless liquid with an aromatic odor. Odor Threshold of 0.092-0.60.	Regulated primarily because of its potential to irritate the eyes and respiratory system. In addition, effects of overexposure may include headaches, narcotic effects, CNS changes (i.e., coordination impairment, impaired reflexes, tremoring) difficulty in breathing, possible chemical pneumonia, and potentially respiratory failure or coma.
Dichlorobenzene	o-95-50-1 p-106-46-7	PID: o-I.P. 9.06 eV, p-I.P. 8.98 High response with PID and 10.2 eV lamp  FID: 50% relative response ratio with FID.	Air sample using charcoal sorbent tube; and carbon disulfide desorption with gas chromatography-flame ionization detector; Sampling and analytical protocol in accordance with OSHA Method #07, and NIOSH Method #1003.	ACGIH: o- 25 ppm; 50 ppm STEL p- 10 ppm  OSHA: o- 50 ppm Ceiling p- 75 ppm  IDLH: 150 ppm	Adequate - Odor threshold o- 0.70 ppm (pleasant aromatic odor); p- 0.12 ppm (mothball odor). Can use air-purifying respirator with organic vapor cartridge/dusts and mists for concentrations up to 1000 ppm.  Recommended glove: Viton - >4.00 hrs; Nitrile - 0.35 hrs	<b>Boiling Pt:</b> 345-357°F; 174-181°C <b>Melting Pt:</b> o- 2°F; -17°C; p- 128°F; 53°C <b>Solubility:</b> 0.008-0.01% <b>Flash Pt:</b> 150°F; 66°C <b>LEL/LFL:</b> 2.2% <b>UEL/UFL:</b> 9.2% <b>Vapor Density:</b> 3.88 <b>Vapor Pressure:</b> 1 mmHg @ 72°F; 22°C <b>Specific Gravity:</b> o- 1.3; p- 1.25 <b>Incompatibilities:</b> Strong oxidizers, halogens, acids, and acid fumes <b>Appearance and Odor:</b> o- colorless to pale yellow liquid with a pleasant aromatic odor. p- colorless to white crystalline solid with a mothball like odor.	Overexposure to either of these isomers may cause irritation to the eyes, nose, throat, and respiratory tract. Symptoms associated with the o- dichlorobenzene may also include skin blisters. Prolonged or repeated exposures may result in chronic effects including damage to the liver and kidneys.  Additionally, overexposure to p- Dichlorobenzene may result in headache, nausea, vomiting, swelling of the area around the eyes, and profuse runny nose. Chronically symptoms may include anorexia, jaundice, cirrhosis of the liver. This substance has demonstrated kidney and liver cancer causing capabilities.
Naphthalene	91-20-3	PID: I.P. 8.12 eV, relative response ratio unknown.  No information was found as to the relative response for FID, however it is certain it is detectable at a high response.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol in accordance with OSHA Method #35 or NIOSH Method #1501.	OSHA; NIOSH; ACGIH: 10 ppm  NIOSH; ACGIH: have established a STEL of 15 ppm.  IDLH: 250 ppm	Odor Threshold 0.038 ppm, Adequate - Use an air purifying respirator with organic vapors and dust/mists cartridges for concentrations up to 250 ppm.  Recommended glove: Nitrile >6.00 hrs; Neoprene >6.00 hrs	<b>Boiling Pt:</b> 424°F; 218°C <b>Melting Pt:</b> 176°F; 80°C <b>Solubility:</b> 0.003% <b>Flash Pt:</b> 174°F; 79°C <b>LEL/LFL:</b> 0.9% <b>UEL/UFL:</b> 5.9% <b>Vapor Density:</b> Not available <b>Vapor Pressure:</b> 1 mmHg <b>Specific Gravity:</b> 1.15 <b>Incompatibilities:</b> Strong oxidizers, chromic anhydride <b>Appearance and odor:</b> Colorless to brown solid with and odor of mothballs	Overexposure to this substance may result in irritation to the eyes, headache, confusion, excitement, nausea, vomiting, abdominal pain, irritation of the bladder, profuse sweating, jaundice, blood in the urine, renal (kidney shutdown), and dermatitis. Prolonged or chronic exposure may further cause optical neuritis, and corneal damage. Target organs are listed as eyes, blood, liver, kidneys, skin, red blood cells, and central nervous system.

**TABLE 6-1**  
**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA**  
**NAVAL AIR STATION PENSACOLA**

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Methyl-t-butyl ether	1634-04-4	PID: 80% Relative response ratio for 10.6 eV PID detection  FID: 200% Relative response ratio for FID detection.	Charcoal filter collection; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall be in accordance with NIOSH Method #1501.	ACGIH: 40 ppm  AIHA WEEL: 100 ppm	Respiratory Protection: Odor threshold 0.7 ppm, adequate air purifying respirator with organic vapor cartridges up to 25 ppm.  Recommended Gloves: Nitrile >6.00 hrs; PV alcohol >6.00 hrs; Viton/neoprene >8.00 hrs	<b>Boiling Pt:</b> 132°F; 55°C <b>Melting Pt:</b> -148°F; -100°C <b>Solubility:</b> 4.8 g/100 g water <b>Flash Pt:</b> 82°F; 28°C <b>LEL/LFL:</b> 1.65% <b>UEL/UFL:</b> 8.4% <b>Vapor Density:</b> 3.0 <b>Vapor Pressure:</b> 245 mmHg @ 77°F; 25°C <b>Specific Gravity:</b> 0.74 @ 20/20°C <b>Incompatibilities:</b> Strong oxidizers, peroxides, and strong acids <b>Appearance and Odor:</b> Colorless liquid with a terpene like odor.	Overexposure to this substance may result in irritation to the eyes, skin, and mucous membranes. Systemically, CNS effects manifests in confusion, sleepiness, coma, and possible kidney damage.
Styrene	100-42-5	PID: I.P. 8.40 eV, relative response ratio is 200%.  FID: 85% relative response ratio for FID detection.	Charcoal filter collection; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall be in accordance with NIOSH Method #1501.	NIOSH & ACGIH: 50 ppm; 100 STEL  OSHA: 100 ppm; 200 ppm (Ceiling)	Odor threshold 0.14 ppm. An air purifying respirator equipped with a combination filter for organic vapors filter is acceptable.  Recommended glove: PV Alcohol >6.00 hrs; Nitrile 0.50 hrs; Teflon >4.00 hrs.	<b>Boiling Pt:</b> 293°F; 145°C <b>Melting Pt:</b> -23°F; -30°C <b>Solubility:</b> 0.03% <b>Flash Pt:</b> 88°F; 31°C <b>LEL/LFL:</b> 0.9% <b>UEL/UFL:</b> 6.8% <b>Vapor Density:</b> Not available <b>Vapor Pressure:</b> 5 mmHg <b>Specific Gravity:</b> 0.91 <b>Incompatibilities:</b> Strong oxidizers, catalysts for vinyl polymers, peroxides, strong acids, and aluminum chloride <b>Appearance and Odor:</b> Colorless to a light yellow oily liquid with a penetrating sweet floral odor. Note: Subjected to light and air this substance may begin to polymerize to form peroxides.	Overexposure to this substance may result in irritation to the eyes, skin, nose, throat, and respiratory system. CNS effects include giddiness, lightheadedness, headaches, staggered gait, fatigue, and lassitude and depression. Additional effects may include nausea. Long duration exposures may result in defatting dermatitis, possible liver and reproductive effects.
Toluene	108-88-3	PID: I.P. 8.82 eV, High response with PID and 10.2 eV lamp.  FID: 110% response with FID.	Air sample using charcoal tube; carbon disulfide desorption. Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1500.	OSHA: 200 ppm 300 ppm (Ceiling)  ACGIH: 50 ppm (skin)  NIOSH: 100 ppm 150 ppm STEL  IDLH: 500 ppm	Adequate - Odor threshold 1.6 ppm is considered good. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm.  Recommended gloves: Teflon >15.00 hrs; Viton >16.00 hrs; silver shield >6.00 hrs; supported nitrile (Useable time limit 0.5 hr, complete submersion for the nitrile selection); PV alcohol >25.00 hrs	<b>Boiling Pt:</b> 232°F; 111°C <b>Melting Pt:</b> -139°F; -95°C <b>Solubility:</b> 0.05% (61°F; 16°C) <b>Flash Pt:</b> 40°F; 4°C <b>LEL/LFL:</b> 1.2% <b>UEL/UFL:</b> 7.1% <b>Vapor Density:</b> 3.14 <b>Vapor Pressure:</b> 20 mmHg @ 65°F; 18°C <b>Specific Gravity:</b> 0.87 <b>Incompatibilities:</b> Strong oxidizers <b>Appearance and odor:</b> Colorless liquid with a sweet pungent aromatic odor.	Overexposure to this substance may result in mild to moderate irritation at all points of contact, and CNS changes including euphoria, confusion, nervousness, and possibly paresthesia characterized by an abnormal burning sensation, pricking, or numbness. At 200-500 ppm exposure has resulted in headaches, nausea, eye irritation, loss of appetite, bad taste, impair coordination, fatigue, and weariness. Chronically, toluene overexposure may result in dermatitis, liver, and kidney damage.

**TABLE 6-1**  
**CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA**  
**NAVAL AIR STATION PENSACOLA**

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Xylene All isomers o-,m-, p-	1330-20-7	PID: I.P. 8.56 eV, High response with PID and 10.2 eV lamp.  FID: 110% response with FID.	Air sample using charcoal tube; carbon disulfide desorption; GC/FID detection. Sampling and analytical protocol shall proceed in accordance with OSHA 07, or NIOSH Method 1500.	ACGIH, & NIOSH: 100 ppm, 150 ppm STEL  OSHA: 100 ppm  IDLH: 900 ppm	Adequate - Odor thresholds for the following isomers: 0.6 m-; 5.4 p-; 20 o- ppm. Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm concentrations.  <b>Recommended gloves:</b> PV Alcohol >12.67 hrs; Viton >8.00 hrs; CPE >1.00 hr; Butyl 0.87 hrs; Nitrile is acceptable for limited operations and contact (>0.20 hrs)	<b>Boiling Pt:</b> 269-281°F; 132-138°C <b>Melting Pt:</b> -13o/-54m/56p°F; -25o/- 48m/13p °C <b>Solubility:</b> 0.02 % <b>Flash Pt:</b> 81-90°F; 27-32°C <b>LEL/LFL:</b> 0.9% <b>UEL/UFL:</b> 7.0% <b>Vapor Density:</b> 3.66 <b>Vapor Pressure:</b> 7-9 mmHg @ 70° F; 21°C <b>Specific Gravity:</b> 0.86-0.88 <b>Incompatibilities:</b> Strong oxidizers and strong acids <b>Appearance and odor:</b> Colorless liquid with an aromatic odor.	Effects may of overexposure include irritation at all points of contact, CNS changes (i.e. dizziness, excitement, drowsiness, incoherent, staggering gait), difficulty in breathing, pulmonary edema, and possibly respiratory failure.  Chronic effects may include dermatitis and cornea vacuolization.



## 6.2 PHYSICAL HAZARDS

In addition to the chemical hazards discussed above, the following physical hazards may be present during the performance of the site activities.

- Heavy equipment hazards
- Slips, trips, and falls
- Energized systems (contact with underground or overhead utilities)
- Lifting (strain/muscle pulls)
- Ambient temperature extremes (heat stress)
- Pinches and compressions
- Vehicular and foot traffic

These physical hazards are discussed in Table 5-1 as applicable to each site task. Further, many of these hazards are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual. Specific discussions on some of these hazards are presented below.

### 6.2.1 Energized Systems (Contact with Underground or Overhead Utilities)

Underground utilities such as pressurized lines, water lines, telephone lines, buried utility lines, and high voltage power lines may be present throughout the facility. **Therefore, subsurface activities must be conducted following the requirements of the Tetra Tech NUS SOP for “Utility Locating and Excavation Clearance (HS-1.0)”**. A copy of this SOP is provided as Attachment III. Clearance of underground and overhead utilities for each sample location will be coordinated with NAS Pensacola personnel. Greg Campbell is the point-of-contact for NAS Pensacola and can be reached at (850) 452-4611 ext 103. Additionally, drilling operations will be conducted at a safe distance from overhead power lines. In certain cases, NAS Pensacola personnel may need to de-energize electrical cables using facility lockout/tagout procedures to insure electrical hazards are eliminated.

### 6.2.2 Ambient Temperature Extremes (Heat Stress)

Overexposure to high ambient temperatures (heat stress) may exist during performance of this work depending on the project schedule. Work performed when ambient temperatures exceed 70°F may result in varying levels of heat stress (heat rash, heat cramps, heat exhaustion, and/or heat stroke) depending on variables such as wind speed, humidity, and percent sunshine, as well as physiological factors such as metabolic rate and skin moisture content. Additionally, workload and level of protective equipment will affect the degree of exposure. Site personnel will be encouraged to drink plenty of fluids

to replace those lost through perspiration. The SSO will recommend additional heat stress control measures as they are deemed necessary as per ACGIH guidelines.

### **6.3 NATURAL HAZARDS**

Insect/animal bites and stings, poisonous plants, and inclement weather are natural hazards that may be present given the location of activities to be conducted. In general, avoidance of areas of known infestation or growth will be the preferred exposure control for insects/animals and poisonous plants. Specific discussion on principle hazards of concern follows:

#### **6.3.1 Insect/Animal Bites and Stings**

Site personnel who are allergic to stinging insects such as bees, wasps, and hornets must be particularly careful since severe illness and death may result from allergic reactions. As with any medical condition or allergy, information regarding the condition must be listed on the Medical Data Sheet (See Attachment II) and the FOL and SSO notified. There are several species indigenous to Florida that may be found on site and should be considered.

#### **Alligators**

Alligators live in all Florida counties but are most common in the major river drainage basins and large lakes in the central and southern portions of the state. They also can be found in marshes, swamps, ponds, drainage canals, phosphate-mine settling ponds, and ditches. Alligators are tolerant of poor water-quality and occasionally inhabit brackish marshes along the coast. A few even venture into salt water.

Mature alligators seek open water areas during the April-to-May courtship and breeding season. After mating, the females move into marsh areas to nest in June and early July where they remain until the following spring. Males generally prefer open and deeper water year-round. Alligators less than four feet long typically inhabit the marshy areas of lakes and rivers. Dense vegetation in these habitats provides protective cover and many of the preferred foods of young alligators.

- Most human attacks associated with alligators occur when they have been fed by humans or when defending their nests.
- Under no circumstances should you approach an alligator closely. They are quite agile, even on land. As with any wild animal, alligators merit a measure of respect.

- Alligators are classified as a threatened species and thus enjoy the protection of state and federal law. Only representatives of the Florida Game and Fresh Water Fish Commission are empowered to handle nuisance alligators.
- It is illegal to feed, tease, harass, molest, capture or kill alligators.
- If a serious problem does exist, contact the Florida Game and Fresh Water Fish Commission.

## Snakes

Areas to be investigated on this project could be prime nesting and/or hiding locations for snakes. Personnel should avoid reaching into areas that are not visibly clear of snakes or insects. Snake chaps will be worn in areas of known or anticipated snake infestation.

Although 45 species of snakes are found in Florida, only the 6 are poisonous and a danger to humans. If you find a snake and you do not know whether or not it is poisonous, the safest thing to do is leave it alone. Florida snakes are not aggressive and, unless they are cornered, most will flee when humans approach. Occasionally, you might encounter one that is reluctant to leave because it is basking in the sun to get warm. Among snakebite victims, an unacceptably high number are bitten on the hands and arms when they are handling the snake. **Do not catch a snake and do not handle one unless you are sure it is not poisonous.** In addition, for a short time after a snake is killed, its reflexes may continue to work. Those reflexes typically cause the body to writhe slowly for awhile, but they can cause a convulsive contraction and a bite, so you should not handle a freshly killed venomous snake.

**Copperhead** - Average adult size is 22-36 inches (56-91 cm), record is 53 inches (135 cm). It is a stout-bodied snake with broad, light brown to gray cross bands, alternating with dark brown to reddish-brown cross bands. Constrictions along the backbone give the dark bands an hourglass shape. On the sides of the body the dark bands usually have light centers, and occasionally one dark spot. Southern copperheads sometimes have an overall pinkish tint. The top of head in front of the eyes is covered with large plate-like scales. The pupil is elliptical, a catlike vertical slit. There is a deep facial pit between the nostril and the eye. The preferred habitat is low, wet areas around swamps, streambeds, river bottoms, and damp ravines, but it also occurs on the hillsides above the wet areas. It also is found in suburban neighborhoods near people. Copperhead bites are extremely painful but usually are not life-threatening for healthy adults. As with poisonous snakebites, the victim should seek immediate medical care from a physician or hospital experienced in treating snakebite

**Cottonmouth** - Average adult size is 20-48 inches (51-121 cm), record is 74.5 inches (189 cm) and is a dark-colored, heavy-bodied snake. Juveniles are brightly colored with reddish-brown cross bands on a brown ground color. The dark cross bands contain many dark spots and speckles. The pattern darkens with age so adults retain only a hint of the former banding or are a uniform black. The eye is camouflaged by a broad, dark, facial stripe. The head is thick and distinctly broader than the neck, and when viewed from above, the eyes cannot be seen. The top of head in front of the eyes is covered with large plate-like scales. The pupil is vertical (catlike). There is a deep facial pit between the nostril and the eye. Its habitat is any wetlands or waterway in the state. Cottonmouths can be found along streams, springs, rivers, lakes, ponds, marshes, swamps, sloughs, reservoirs, retention pools, canals, and roadside ditches. It occasionally wanders far from water, and has been found in bushes and trees. Cottonmouth bites can be quite dangerous. The victim should seek immediate medical care from a physician or hospital experienced in treating snakebite.

**Eastern Diamondback Rattlesnake** - Average adult size is 36-72 inches (91-183 cm), record is 96 inches (244 cm). It is a large, heavy-bodied snake with a row of large dark diamonds with brown centers and cream borders down its back. The ground color of the body is brownish. The tail ends in a rattle. The tail is usually a different shade, brownish or gray, and toward the end of the tail the diamonds fade out or break into bands. The large and thick head has a light bordered dark stripe running diagonally through the eye and there are vertical light stripes on the snout. The pupil is vertical (catlike) and there is a deep facial pit between the nostril and the eye. Diamondbacks are often found in pine flat woods, longleaf pine and turkey oak, and sand pine scrub areas. These habitats contain palmetto thickets and gopher tortoise burrows in which the Diamondback may seek refuge. This is a large and potentially dangerous snake. It can strike up to 2/3 its body length; a 6-foot (183 cm) specimen may strike 4 feet (122 cm).

**Timber Rattlesnake** - Average adult size is 36-60 inches (76-152 cm), record is 74.5 inches (189 cm). Can be a large, heavy-bodied snake. The reddish brown stripe running down the center of the back is disrupted by a series of large, black, chevron-like cross bands on the pinkish gray or tan body. The tail is uniform black. The head is large and sometimes with a dark diagonal line through the eye or just behind the eye. The pupil is vertical (catlike) and there is a facial pit between the nostril and the eye. The tail ends in a rattle. Timber rattlesnakes in Florida prefer low bottomlands where it is fairly damp, river beds, hammocks pine flat woods, swamps, and cane thickets. This snake should be given a wide berth and left alone. Because of its cryptic coloration (camouflage), it can be easily overlooked, especially if it does not rattle.

**Dusky Pygmy Rattlesnake** - Average adult size is 12-24 inches (30-61 cm), record is 31 inches (79 cm). This is a small snake, but very thick for its size. The top of the triangular shaped head is covered with 9 large scales. The body color is light to dark gray. A longitudinal row of black or charcoal transverse blotches disrupts a reddish brown stripe running down the middle of the back. Dark spots on the side line up with the blotches. The tail is slender and ends in a miniature rattle. The belly is heavily mottled with black and white. The pupil of the eye is vertical (catlike), and there is a deep facial pit between the nostril and the eye. This snake is common in lowland pine flat woods, prairies, around lakes and ponds, and along the borders of many freshwater marshes and cypress swamps. This small snake has a reputation for being very aggressive. Its bite, while usually not life threatening, is extremely painful and can result in the loss of a digit. However, In some cases it can be fatal. The rattle is so small it is seldom heard. When it is heard, it sounds like an insect buzzing. Florida's two hognose snakes occasionally are confused with the Pygmy Rattlesnake. It is easy to distinguish between the harmless hognose snakes and the Pygmy Rattlesnake. The harmless hognose snakes defend themselves against potential predators by spreading (flattening) their heads and necks. If this does not scare the threat away, the hognose snakes will turn onto their backs and play dead. The hognose snakes have upturned noses and round pupils, and they also have no facial pits or rattles.

**Eastern Coral Snake** - Average adult size is 20-30 inches (51-76 cm), record is 47.5 inches (121 cm). Body ringed with black, yellow, and red; narrow yellow rings separating the wider red and black rings. The rings continue across the belly of the snake. From tip of snout to just behind the eye the head is black. The tail is black and yellow, without any red rings. The red rings usually contain black flecks or spots. The pupil is round. This snake occupies a variety of habitats, from dry, well-drained flat woods and scrub areas to low, wet hammocks and the borders of swamps. They are quite secretive and are usually found under debris and in the ground, but occasionally they are found in the open, and have even been seen climbing the trunks of live oaks. Good numbers of them are turned up when pine flat woods are bulldozed. Because they also are ringed with red, black, and yellow or white, two harmless snakes in Florida, the Scarlet Kingsnake and the Scarlet Snake, often are confused with the Coral Snake. Both of these mimics (look-a-likes) can be distinguished from the Coral Snake by their red snouts and red on their tails. In addition, the red bands of the Scarlet Kingsnake and the Scarlet Snake never touch the yellow bands (the red and yellow are separated by the black). Also, on both the Coral Snake and the Scarlet Kingsnake the rings go all the way around the body, but not on the Scarlet Snake which has a white belly. If you have difficulty separating the harmless mimics from the Coral Snake, the following mnemonic rhymes will identify the Coral Snake for you: 'If red touches yellow, it can kill a fellow,' and 'If its nose is black, it's bad for jack.' Because the Coral Snake is a relative of the cobras, people believe its bite nearly always is fatal. While its bite is serious and should receive immediate medical attention,

statistics suggest that the bite of the Coral Snake is less threatening than the bite of a Diamondback Rattlesnake.

### **Mosquito-Borne Illness**

**West Nile Virus (WNV)** transmitted to humans by mosquitoes can cause encephalitis. The mosquito becomes infected by feeding on birds infected with the WNV. Infected mosquitoes then transmit the WNV to humans and animals when biting (or taking a blood-meal). Mosquitoes become infected after biting infected birds. The symptoms for mosquito-borne illnesses may include headache, moderate to high fever, stiff neck and confusion. In serious cases coma, seizures or paralysis can result. Symptoms usually appear between 5 to 15 days after exposure to infected mosquitoes. Mosquito-borne illnesses may be mild or serious and can lead to death. WNV encephalitis is NOT transmitted from person-to-person. There is no evidence that a person can get the virus from handling live or dead infected birds. However, avoid bare-handed contact when handling any dead animals, including dead birds. Ticks have not been implicated as vectors of West Nile-like virus.

Mild infections are common and include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, rarely, and death (especially in the elderly and very young). The incubation period of WNV encephalitis is usually 3 to 12 days. There is no specific therapy or vaccine against WNV encephalitis.

**Eastern Equine Encephalitis (EEE)** – is a virus that circulates in nature primarily in a bird-mosquito cycle with man, horses and exotic gamebirds (Pheasants and Chukar partridges) as dead end hosts. The virus appears to be confined primarily to states along the Atlantic and Gulf coasts causing clinical cases in unvaccinated equines every summer. Epidemics in humans are quite rare; occurring only four time in the past 62 years in Massachusetts, Louisiana and New Jersey. The virus is usually circulated throughout the year in fresh-water swamps by mosquitoes that prefer feeding on wild birds. An incubation period of 3 to 7 days is usually followed by acute onset of fever, headache, stiff neck, disorientation, and lethargy, convulsions, and other signs of encephalitis sometimes followed by coma and death.

### **Precautions include:**

- Limit outdoor activities during peak mosquito times – at dusk and dawn.
- Avoid standing water
- Wear long-sleeved shirts and long pants whenever you are outdoors.

- Apply insect repellent according to manufacturers instruction to exposed skin. An effective repellent will contain 20% to 30% DEET (N,N-diethyl-meta-toluamide). Avoid products containing more than 30% DEET.
- Spray clothing with repellents containing permethrin or DEET, mosquitoes may bite through thin clothing.

### **Ticks**

There are various areas throughout the U.S. where Lyme Disease is endemic. Fortunately, Florida is not one of these areas. Nonetheless, personnel should be aware of the hazards of tick bites and Lyme Disease. The longer a disease carrying tick remains attached to the body, the greater the potential for contracting the disease. Wearing long sleeved shirts and long pants (tucked into boots). As well as performing frequent body checks will prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal. For information regarding tick removal procedures, and symptoms of exposure consult Section 4.0 of the Health and Safety Guidance Manual.

### **Fire Ants**

Fire ants present a unique situation when working outdoors in Florida. Their aggressive behavior and their ability to sting repeatedly can pose a unique health threat. The sting injects venom (formic acid) that causes an extreme burning sensation. Pustules form which can become infected if scratched. Allergic reactions of people sensitive to the venom include dizziness, swelling, shock and in extreme cases unconsciousness and death. People exhibiting such symptoms should see a physician. Fire ants can be identified by their habitat. They build mounds in open sunny areas sometimes supported by a wall or shrub. The mound has no external opening. The size of the mound can range from a few inches across to some which are in excess of two feet or more in height and diameter. When disturbed they defend it by swarming out and over the mound, even running up grass blades and sticks.

An Office of Natural Resources or similar entity on NAS Pensacola should be contacted for further direction on the hazards and precautions of naturally occurring wildlife and insects.

Site personnel who are allergic to stinging insects such as bees, wasps, and hornets must be particularly careful since severe illness and death may result from allergic reactions. As with any medical condition or allergy, information regarding the condition must be listed on the Medical Data Sheet (See Attachment II) and the FOL and SSO notified.

### **6.3.2      Poisonous Plants**

Various plants which can cause allergic reactions may be encountered during field work. These include, poison ivy, poison oak, and poison sumac. Contact with these plants may occur when clearing vegetation for access to work areas, or as a result of movement through these plants. An irritating, allergic reaction can occur after direct contact with the plant or indirect contact through some piece of equipment or clothing article. Oils are transferred from the plant to exposed skin, clothing, or piece of equipment. The degree of the irritating, allergic reaction can vary significantly from one person to the next.

Protective measures to control and minimize the effects of this hazard may include, but not be limited to, the following:

- Identify plants for field personnel.
  - Poison Ivy - Characterized by climbing vines, three leaf configuration ovate to elliptical in shape, deep green leaves with a reddish tint, greenish flowers, and white berries.
  - Poison Sumac - Characterized as a tall bush of the sumac family bearing compound leaves (7-13 entire leaflets), branched from a central axis, drooping, with axillary clusters of white fruit: However, these white fruits and berries may exist only during pubescent stages.
  - Poison oak - Characterized as similar to poison ivy consisting of a shrub, stems erect, 0.3 to 2.0 meters tall, leaflets consist of broad thick lobes coarsely serrated configuration, denser at the base, less so than the top.
- Protective measures may include wearing disposable garments such as Tyvek when clearing brush. These may be carefully removed and disposed of along with any oils accumulated from the plants.
- Personal Hygiene - The oils obtained from the plants will only elicit an allergic response when the person's bare skin layer is contacted. This can be aggravated when skin pores are open (perspiring), or through breaks in the skin such as cuts, nicks, scratches, etc. This can also be accomplished when using excessively hot water for cleaning the skin, which also causes pores to open. Prior to break time, lunchtime, etc. personnel should wash with cool water and soap to remove as much of the oils as possible. In heavily vegetated areas of these plants, additional measures including barrier creams and blocks may be used to prevent the oils from accessing and penetrating the skin.



These plants present an airborne sensitization hazard when burned. This is not to occur as part of this scope of work and therefore will not be addressed.

### **6.3.3      Inclement Weather**

Project tasks under this Scope of Work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather conditions arise (electrical storms, tornados, hailstorms, etc.), the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

A NOAA Weather Radio is the best means to receive watches and warnings from the National Weather Service. The National Weather Service continuously broadcasts updated hurricane advisories that can be received by widely available NOAA Weather Radios.

## **7.0 AIR MONITORING**

Direct reading instruments will be used at the site to detect and evaluate the presence of site contaminants and other potentially hazardous conditions. As a result, specific air monitoring measures and requirements are established in Table 5-1 pertaining to the specific hazards and tasks of an identified operation. Additionally, the Health and Safety Guidance Manual, Section 1.0, contains detailed information regarding direct reading instrumentation, as well as general calibration procedures of various instruments.

### **7.1 INSTRUMENTS AND USE**

Instruments will be used primarily to monitor source points and worker breathing zone areas, while observing instrument action levels. Action levels are discussed in Table 5-1 as they may apply to a specific task or location.

#### **7.1.1 Photoionization Detector or Flame Ionization Detector**

In order to accurately monitor for any substances that may present an exposure potential to site personnel, a Photoionization Detector (PID) using a lamp energy of 10.6 eV or higher will be used. This instrument will be used to monitor potential source areas and to screen the breathing zones of employees during site activities. The PID with this lamp strength has been selected because it is capable of detecting the organic vapors of concern.

Prior to the commencement of any field activities, the background levels of the site must be determined and noted. Daily background readings will be taken away from any areas of potential contamination. These readings, any influencing conditions (i.e., weather, temperature, humidity) and site location must be documented in the field operations logbook or other site documentation (e.g., sample log sheet).

#### **7.1.2 Hazard Monitoring Frequency**

Table 5-1 presents the frequencies that hazard monitoring will be performed as well as the action levels that will initiate the use of elevated levels of protection. The SSO may decide to increase these frequencies based on instrument responses and site observations. The frequency at which monitoring is performed will not be reduced without the prior consent of the PHSO or HSM.

### **7.2 INSTRUMENT MAINTENANCE AND CALIBRATION**

Hazard monitoring instruments will be maintained and pre-field calibrated by the TtNUS Equipment Manager. Operational checks and field calibration will be performed on the instruments each day prior to their use. Field calibration will be performed on instruments according to manufacturer's

recommendations (for example, the PID must be field calibrated daily and an additional field calibration must be performed at the end of each day to determine any significant instrument drift). These operational checks and calibration efforts will be performed in a manner that complies with the employees health and safety training, the manufacturer's recommendations, and with the applicable manufacturer standard operating procedure (copies of which can be found in the Health & Safety Guidance Manual which will be maintained on-site for reference). Calibration efforts must be documented. Figure 7-1 is provided for documenting these calibration efforts. This information may instead be recorded in a field operations logbook, provided that the information specified in Figure 7-1 is recorded. This required information includes the following:

- Date calibration was performed
- Individual calibrating the instrument
- Instrument name, model, and serial number
- Any relevant instrument settings and resultant readings (before and after) calibration
- Identification of the calibration standard (lot no., source concentration, supplier)
- Any relevant comments or remarks

### FIGURE 7-1

## DOCUMENTATION OF FIELD CALIBRATION

**SITE NAME:** \_\_\_\_\_

**PROJECT NO.:** \_\_\_\_\_

[illegible]

## **8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS**

### **8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING**

This section is included to specify health and safety training and medical surveillance requirements for both TtNUS and subcontractor personnel participating in site activities.

#### **8.1.1 Requirements for TtNUS Personnel**

TtNUS personnel must complete 40 hours of introductory hazardous waste site training prior to performing work at the NAS Pensacola facility. Additionally, TtNUS personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training in the past 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120 (e)(4) will be required for site supervisory personnel.

Documentation of TtNUS introductory, supervisory, and refresher training as well as site-specific training will be maintained at the project. Copies of certificates or other official documentation will be used to fulfill this requirement.

#### **8.1.2 Requirements for Subcontractors**

TtNUS subcontractor personnel must have completed introductory hazardous waste site training or equivalent work experience as defined in OSHA Standard 29 CFR 1910.120 (e). Additionally, personnel who have had the introductory training more than 12 months ago, are required to have 8 hours of refresher training meeting the requirements of 29 CFR 1910.120 (e)(8) prior to performing field work at the NAS Pensacola facility if required. TtNUS subcontractors must certify that each employee has had such training by sending TtNUS a letter, on company letterhead, containing the information in the example letter provided as in Figure 8-1 and by providing copies of certificates for subcontractor personnel participating in site activities.

**FIGURE 8-1  
TRAINING LETTER**

The following statements must be typed on company letterhead and signed by an officer of the company and accompanied by copies of personnel training certificates:

LOGO  
XYZ CORPORATION  
555 E. 5th Street  
Nowheresville, Kansas 55555

Month, day, year

Mr. Gerry Walker  
Tetra Tech NUS, Inc.  
Task Order Manager  
1401 Oven Park Drive, Suite 201  
Tallahassee, Florida, 32312

Subject: HAZWOPER Training for NAS Pensacola, Pensacola, Florida

Dear Mr. Walker:

As an officer of XYZ Corporation, I hereby state that I am aware of the potential hazardous nature of the subject project. I also understand that it is our responsibility to comply with applicable occupational safety and health regulations, including those stipulated in Title 29 of the Code of Federal Regulations (CFR), Parts 1900 through 1910 and Part 1926.

I also understand that Title 29 CFR 1910.120, entitled "Hazardous Waste Operations and Emergency Response," requires appropriate level of training for certain employees engaged in hazardous waste operations. In this regard, I hereby state that the following employees have had 40 hours of introductory hazardous waste site training or equivalent work experience as requested by 29 CFR 1910.120(e) and have had 8 hour of refresher training as applicable and as required by 29 CFR 1910.120(e)(8) and that site supervisory personnel have had training in accordance with 29 CFR 1910.120(e)(4).

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555

Sincerely,

(Name and Title of Company Officer)

Enclosed: Training Certificates

## **8.2 SITE-SPECIFIC TRAINING**

TtNUS will provide site-specific training to TtNUS employees and subcontractor personnel who will perform work on this project. Site-specific training will also be provided to personnel (U.S. Department of Defense, EPA, etc.) who may enter the site to perform functions that may or may not be directly related to site operations. Site-Specific training will include:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present at the sites
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Initial response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of Safe Work Permits

Site-specific documentation will be established through the use of Figure 8-2. Site personnel and visitors must sign this document upon receiving site-specific training.

## **8.3 MEDICAL SURVEILLANCE**

### **8.3.1 Medical Surveillance Requirements for TtNUS Personnel**

TtNUS personnel participating in project field activities will have had a physical examination meeting the requirements of TtNUS's medical surveillance program and will be medically qualified to perform hazardous waste site work using respiratory protection.

Documentation for medical clearances will be maintained in the TtNUS Tallahassee office and made available, as necessary.

## SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing remedial investigation activities at NAS Pensacola, Pensacola, Florida and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present at the sites
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Initial response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of Safe Work Permits

I have been given the opportunity to ask questions and they have been answered to my satisfaction. I further state, that the dates of my training (introductory, refresher, and supervisory, as applicable) and my medical surveillance requirements are accurate and correct to the best of my knowledge.

[illegible]





### **8.3.2      Medical Surveillance Requirements for Subcontractors**

Subcontractors are required to obtain a certificate of their ability to perform hazardous waste site work and to wear respiratory protection. The "Subcontractor Medical Approval Form" provided in Figure 8-3 shall be used to satisfy this requirement, providing it is properly completed and signed by a licensed physician.

Subcontractors who have a company medical surveillance program meeting the requirements of paragraph (f) of OSHA 29 CFR 1910.120 can substitute "Subcontractor Medical Approval Form" (See Figure 8-3) with a letter, on company letterhead, containing the information in the example letter presented in Figure 8-4 of this HASP.

### **8.3.3      Medical Data Sheet**

Each field team member (including subcontractors) and visitors entering the Exclusion Zone(s) shall be required to complete and submit a copy of Medical Data Sheet found in Attachment II of this HASP. This shall be provided to the SSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

## **8.4            SUBCONTRACTOR EXCEPTIONS**

Subcontractors who will not enter the Exclusion Zone during operation, and whose activities involve no potential for exposure to site contaminants, will not be required to meet the requirements for training/medical surveillance other than site-specific training as stipulated in Section 8.2. This exception may only be granted by the CLEAN Health and Safety Manager, Matt Soltis.

**FIGURE 8-3**  
**SUBCONTRACTOR MEDICAL APPROVAL FORM**

For \_\_\_\_\_ employees \_\_\_\_\_ of  
\_\_\_\_\_  
Company Name

Participant Name: \_\_\_\_\_ Date of Exam: \_\_\_\_\_

**Part A**

The above-named individual has:

1. Undergone a physical examination in accordance with OSHA Standard 29 CFR 1910.120, paragraph (f) and found to be medically -

- ☐ qualified to perform work at the NAS Pensacola, work site  
☐ not qualified to perform work at the NAS Pensacola, work site

and,

2. Undergone a physical examination as per OSHA 29 CFR 1910.134(b)(10) and found to be medically -

- ☐ qualified to wear respiratory protection  
☐ not qualified to wear respiratory protection

My evaluation has been based on the following information, as provided to me by the employer.

- ☐ A copy of OSHA Standard 29 CFR 1910.120 and appendices.  
☐ A description of the employee's duties as they relate to the employee's exposures.  
☐ A list of known/suspected contaminants and their concentrations (if known).  
☐ A description of any personal protective equipment used or to be used.  
☐ Information from previous medical examinations of the employee which is not readily available to the examining physician.

**Part B**

I, \_\_\_\_\_, have examined \_\_\_\_\_  
Physician's Name (print) Participant's Name (print)

and have determined the following information:

**FIGURE 8-3**  
**SUBCONTRACTOR MEDICAL APPROVAL FORM**  
**PAGE TWO**

1. Results of the medical examination and tests (excluding finding or diagnoses unrelated to occupational exposure):

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2. Any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health:

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---

3. Recommended limitations upon the employee's assigned work:

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---

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I have informed this participant of the results of this medical examination and any medical conditions which require further examination or treatment.

Based on the information provided to me, and in view of the activities and hazard potentials involved at the NAS Pensacola work site, this participant

( ) may  
( ) may not

perform his/her assigned task.

Physician's Signature \_\_\_\_\_

Address \_\_\_\_\_

Phone Number \_\_\_\_\_

NOTE: Copies of test results are maintained and available at:

\_\_\_\_\_  
Address

**FIGURE 8-4**  
**MEDICAL SURVEILLANCE LETTER**

The following statements must be typed on company letterhead and signed by an officer of the company:

LOGO  
XYZ CORPORATION  
555 E. 5th Street  
Nowheresville, Kansas 55555

Month, day, year

Mr. Gerry Walker  
Tetra Tech NUS, Inc.  
Task Order Manager  
1401 Oven Park Drive, Suite 201  
Tallahassee, Florida, 32312

Subject: HAZWOPER Training for NAS Pensacola, Pensacola, Florida

Dear Mr. Walker:

As an officer of XYZ Corporation, I hereby state that the persons listed below participate in a medical surveillance program meeting the requirements contained in paragraph (f) of Title 29 of the Code of Federal Regulations (CFR) Part 1910.120, entitled "Hazardous Waste Operations and Emergency Response. I further state that the persons listed below have had physical examinations under this program within the past 12 months and that they have been cleared, by a license physician, to perform hazardous waste site work and to wear positive- and negative-pressure respiratory protection. I also state that, to my knowledge, no person listed below has any medical restriction that would preclude him/her from working at the NAS Pensacola facility.

LIST OF FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555

Sincerely,

(Name and Title of Company Officer)

## **9.0 SITE CONTROL**

This section outlines the means by which TtNUS will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. It is anticipated that a three-zone approach will be used during work at this site: Exclusion Zone, Contamination Reduction Zone, and Support Zone. It is also anticipated that this control measure will be used to control access to site work areas. Use of such controls will restrict the general public, minimize potentials for the spread of contaminants and to protect individuals who are not cleared to enter the work areas.

### **9.1 EXCLUSION ZONE**

The Exclusion Zone will be considered those areas of the site of known or suspected contamination. It is not anticipated that significant amounts of surface contamination are in the proposed work areas of this site. It is anticipated that this will remain so until/unless contaminants are brought to the surface by intrusive activities such as drilling. Furthermore, once such activities have been completed and surface contamination has been removed, the potential for exposure is again diminished and the area can then be reclassified as part of the Contamination Reduction Zone. Therefore, the Exclusion Zones for this project will be limited to those areas if the site where active work is being performed plus so many feet surrounding the point of operation (See Table 5-1 for specific operation). The Exclusion Zone for this activity will represent the areas where the soils are disturbed through soil borings and sampling activities. Exclusion Zones will be delineated (as necessary) using barrier tape, cones and/or drive poles, and postings to inform and direct facility personnel.

#### **9.1.1 Exclusion Zone Clearance**

A pre-startup site visit will be conducted by members of the field team in an effort to identify proposed subsurface investigation locations, conduct utility clearances, and provide up-front notices concerning scheduled activities within the facility. Subsurface activities will only proceed with proper utility clearance. In the event that a utility is struck during a subsurface investigative activity, the Navy Engineer-in-Charge identified in Section 2.7, Table 2-1 will be notified.

When base personnel are working within the proximity of this investigation, they will be moved or their operation temporarily discontinued to protect them from potential hazards associated with this operation.

### **9.2 CONTAMINATION REDUCTION ZONE**

The Contamination Reduction Zone (CRZ) will be a buffer area between the Exclusion Zone and any area of the site where contamination is not suspected. This area will also serve as a focal point in supporting Exclusion Zone activities. This area may be delineated using barrier tape, cones, and postings to inform and direct facility

personnel. Decontamination will be conducted at a central location. Equipment potentially contaminated will be bagged and taken to that location for decontamination.

### **9.3 SUPPORT ZONE**

The Support Zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. The Support Zones will be established at areas of the site where exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

### **9.4 SAFE WORK PERMITS**

Exclusion Zone work conducted in support of this project will be performed using Safe Work Permits to guide and direct field crews on a task by task basis. An example of the Safe Work Permit to be used is illustrated in Figure 9-1. Partially completed Permits for the work to be performed are included in Attachment V. The daily meetings conducted at the site will further support these work permits. This effort will ensure that site-specific considerations and changing conditions are incorporated into the planning effort. Permits will require the signature of the FOL and/or the SSO.

Use of these permits will provide the communication line for reviewing protective measures and hazards associated with each operation. This HASP will be used as the primary reference for selecting levels of protection and control measures. The work permit will take precedence over the HASP when more conservative measures are required based on specific site conditions.

Permits will be turned into the FOL and/or the SSO upon reaching their termination period or upon completion of the task for which the permit was issued.

### **9.5 SITE VISITORS**

Site visitors for the purpose of this document are identified as representing the following groups of individuals:

- Personnel invited to observe or participate in operations by TtNUS
- Regulatory personnel (DOD, FDEP, OSHA, etc.)
- Southern Division Navy Personnel
- Other authorized visitors

# **FIGURE 9-1 SAFE WORK PERMIT**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

**I. Work limited to the following (description, area, equipment used):** \_\_\_\_\_

**II. Primary Hazards:** Potential hazards associated with this task: \_\_\_\_\_

**III. Field Crew:** \_\_\_\_\_

**IV. On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector \_\_\_\_\_ TtNUS

**Equipment Inspection required** ☐ Yes ☐ No Initials of Inspector \_\_\_\_\_ TtNUS

**V. Protective equipment required** **Respiratory equipment required**

Level D ☐ Level B ☐ Yes ☐ Specify on the reverse

Level C ☐ Level A ☐ No ☐

Modifications/Exceptions: \_\_\_\_\_

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**Primary Route(s) of Exposure/Hazard:** \_\_\_\_\_

**(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)**

**VII. Additional Safety Equipment/Procedures**

Hard-hat ..... ☐ Yes ☐ No Hearing Protection (Plugs/Muffs) ..... ☐ Yes ☐ No

Safety Glasses ..... ☐ Yes ☐ No Safety belt/harness ..... ☐ Yes ☐ No

Chemical/splash goggles ..... ☐ Yes ☐ No Radio/Cellular Phone ..... ☐ Yes ☐ No

Splash Shield ..... ☐ Yes ☐ No Barricades ..... ☐ Yes ☐ No

Splash suits/coveralls ..... ☐ Yes ☐ No Gloves (Type – Work ) ..... ☐ Yes ☐ No

Impermeable apron ..... ☐ Yes ☐ No Work/rest regimen ..... ☐ Yes ☐ No

Steel toe work shoes or boots.... ☐ Yes ☐ No Chemical Resistant Boot Covers .... ☐ Yes ☐ No

High Visibility vest ..... ☐ Yes ☐ No Tape up/use insect repellent ..... ☐ Yes ☐ No

First Aid Kit ..... ☐ Yes ☐ No Fire Extinguisher ..... ☐ Yes ☐ No

Safety Shower/Eyewash ..... ☐ Yes ☐ No Other ..... ☐ Yes ☐ No

Modifications/Exceptions: \_\_\_\_\_

**VIII. Site Preparation**

	Yes	No	NA
Utility Locating and Excavation Clearance completed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Hazards Identified and Isolated (Splash and containment barriers).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.) .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**IX. Additional Permits required** (Hot work, confined space entry, excavation etc.)..... ☐ Yes ☐ No

*If yes, SHSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090*

**X. Special instructions, precautions:** \_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_



It is not anticipated that this operation will result in a large number of site visitors. However, as some visitors can reasonably be expected, the following requirements will be enforced:

- Site visitors will be directed to the FOL, who will sign them in to the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), who they represent, and purpose for the visit.
- Site visitors will be required to produce the necessary information supporting clearance onto the site. This includes information attesting to applicable training (40-hours of HAZWOPER training required for Southern Division Navy personnel) and medical surveillance, as stipulated in Section 8 of this document. In addition, to enter the site's operational zones during planned activities, visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this document.

**NOTE: Site visitors will be escorted while at the site.**

Following this, the site visitor will be permitted to enter the site and applicable operational areas. Visitors are required to observe the protective equipment and site restrictions in effect at the area of their visit. Visitors must meet the requirements as stipulated in this plan for site clearance to be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause onsite activities to be terminated until that visitor can be removed. Removal of unauthorized visitors will be accomplished with support from the Base Contact, if necessary. At a minimum, the Navy On-site Representative will be notified of any unauthorized visitors.

## **9.6 SITE SECURITY**

Site security will be accomplished using TtNUS field personnel. TtNUS will retain complete control over active operational areas. As this activity takes place at Navy facilities open to public access, and along public highways, the first line of security will take place using traffic permit restrictions, Exclusion Zone barriers, and any existing barriers at the sites to restrict the general public. The second line of security will take place at the work site referring interested parties to the FOL or designee. The FOL will serve as a focal point for non-project interested parties, and serve as the final line of security and the primary enforcement contact.

## **9.7 SITE MAP**

Once the areas of contamination, access routes, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. When possible, these maps will be posted to illustrate up-to-date collection of contaminants and adjustment of zones and access points.

## **9.8 BUDDY SYSTEM**

Personnel engaged in on-site activities will practice the "buddy system" to ensure the safety of personnel involved in this operation.

## **9.9 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS**

TtNUS and subcontractor personnel will provide MSDSs for chemicals brought on-site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of the substances on-site. A chemical inventory of chemicals used at the sites will be developed using the Health and Safety Guidance Manual. The MSDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

## **9.10 COMMUNICATION**

As personnel will be working in proximity to one another during field activities, a supported means of communication between field crews members will not be necessary. External communication will be accomplished by using the telephones at predetermined and approved locations. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities, the FOL will determine and arrange for telephone communications.

## **10.0 SPILL CONTAINMENT PROGRAM**

### **10.1 SCOPE AND APPLICATION**

It is not anticipated that bulk hazardous materials (over 55-gallons) will be handled at any given time as part of this scope of work. It is also not anticipated that such spillage would constitute a danger to human health or the environment. However, as the job progresses, the potential may exist for accumulating Investigative Derived Wastes (IDW) such as decontamination fluids, soil cuttings, and purge and well development waters, in a central staging area. Once these fluids and other materials have been characterized, they can be removed from this area and properly disposed.

### **10.2 POTENTIAL SPILL AREAS**

Potential spill areas will be periodically monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, limited areas are vulnerable to this hazard including:

- Resource deployment
- Waste transfer
- Central staging

It is anticipated that IDW generated as a result of this scope of work will be containerized, labeled, and staged to await further analyses. The results of these analyses will determine the method of disposal.

### **10.3 LEAK AND SPILL DETECTION**

To establish an early detection of potential spills or leaks, a periodic walk-around by the personnel staging or disposing of drums or in the Resource Deployment area will be conducted during working hours to visually determine that storage vessels are not leaking. If a leak is detected, the contents will be transferred, using a hand pump, into a new vessel. The leak will be collected and contained using absorbents such as Oil-Dry, vermiculite, or sand, which are stored at the vulnerable areas in a conspicuously marked drum. This used material, too, will be containerized for disposal pending analysis. Inspections will be documented in the project logbook.

### **10.4 PERSONNEL TRAINING AND SPILL PREVENTION**

Personnel will be instructed in the procedures for initial spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and the SSO will serve as the Spill Response Coordinators for this operation, should the need arise.

## **10.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT**

The following represents the minimum equipment that may be maintained (depending on anticipated need) at the staging areas for the purpose of supporting this Spill Prevention/Containment Program.

- Sand, clean fill, vermiculite, or other non combustible absorbent (Oil-dry)
- Drums (55-gallon U.N 1A2)
- Shovels, rakes, and brooms
- Container labels

## **10.6 SPILL CONTROL PLAN**

This section describes the procedures the TtNUS field crew members will employ upon the detection of a spill or leak.

- Notify the SSO or FOL immediately upon detection of a leak or spill. Activate emergency alerting procedures for that area to remove non-essential personnel.
- Employ the personal protective equipment stored at the staging area. Take immediate actions to stop the leak or spill by plugging or patching the container or raising the leak to the highest point in the vessel. Spread the absorbent material in the area of the spill, covering it completely.
- Transfer the material to a new vessel; collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment and disposal options.
- Re-containerize spills, including 2-inch of top cover impacted by the spill. Await test results for treatment or disposal options.

It is not anticipated that a spill will occur that the field crew cannot handle. Should this occur, notification of the appropriate Emergency Response agencies will be carried out by the FOL or SSO in accordance with the procedures discussed in Section 2.0 of this HASP.

## 11.0 CONFINED-SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter any confined spaces. A confined space is defined as an area which has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

A Permit-Required Confined Space is one that:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the Health and Safety Guidance Manual or call the PHSO. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

## 12.0 MATERIALS AND DOCUMENTATION

The TtNUS FOL shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- Material Safety Data Sheets for chemicals brought on-site, including decon solution, fuels, sample preservations, calibration gases, etc.
- A full size OSHA Job Safety and Health Poster
- Training/Medical Surveillance Documentation Form (blank)
- Emergency Reference Form (Section 2.0, extra copy for posting)

### 12.1 MATERIALS TO BE POSTED OR MAINTAINED AT THE SITE

The following documentation is to be posted or maintained at the site for quick reference purposes. In situations where posting these documents is not feasible, (such as no office trailer), these documents should be separated and immediately accessible.

**Chemical Inventory Listing (posted)** - This list represents chemicals brought on-site, including decontamination solutions, sample preservations, fuel, etc.. This list should be posted in a central area.

**Material Safety Data Sheets (MSDS) (maintained)** - The MSDSs should also be in a central area accessible to site personnel. These documents should match the listings on the chemical inventory list for substances employed on-site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

**The OSHA Job Safety & Health Protection Poster (posted)** - this poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaced, altered, or covered by other material.

**Site Clearance (maintained)** - This list is found within the training section of the HASP (See Figure 8-2). This list identifies site personnel, dates of training (including site-specific training), and medical surveillance. The lists indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.

**Emergency Phone Numbers and Directions to the Hospital(s) (posted)** - This list of numbers and directions will be maintained at phone communications points and in each site vehicle.

**Medical Data Sheets/Cards (maintained)** - Medical Data Sheets will be filled out by on-site personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. A copy of this sheet or a wallet card will be given to personnel to be carried on their person (see Attachment II)

**Hearing Conservation Standard (29 CFR 1910.95) (posted)** - this standard will be posted anytime hearing protection or other noise abatement procedures are employed.

**Personnel Monitoring (maintained)** - Results generated through personnel sampling (levels of airborne toxins, noise levels, etc.) will be posted to inform individuals of the results of that effort.

**Placards and Labels (maintained)** - Where chemical inventories have been separated because of quantities and incompatibilities, these areas will be conspicuously marked using DOT placards and acceptable (Hazard Communication 29 CFR 1910.1200(f)) labels.

The purpose, as stated above, is to allow site personnel quick access to this information. Variations concerning location and methods of presentation are acceptable, providing the objection is accomplished.

## 13.0 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long-term Environmental Action - Navy
CNS	Central Nervous System
CSP	Certified Safety Professional
CTO	Contract Task Order
DOD	United States Department of Defense
DPT	Direct Push Technology
eV	electron Volts
FDEP	Florida Department of Environmental Protection
FOL	Field Operations Leader
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSM	Health and Safety Manager
IDLH	Immediate Dangerous to Life or Health
IDW	Investigative-Derived Wastes
LEL/LFL	Lower Explosive Limit / Lower Flammable Limit
MSDS	Material Safety Data Sheets
MTBE	Methyl Tertiary Butyl Ether
N/A	Not Available
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicity Program
ORC	Oxygen Releasing Compound
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Officer
PID	Photoionization Detector
PPE	Personal Protective Equipment
SAP	Sampling and Analyses Plan
SOPs	Standard Operating Procedures



SSO	Site Safety Officer
SVOC	Semi Volatile Organic Compound
TBD	To be determined
TLV	Threshold Limit Value
TOM	Task Order Manager
TPH	Total Petroleum Hydrocarbons
TRPH	Total Recoverable Petroleum Hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
TWA	Time-Weighted Average
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WP	Work Plan

# **ATTACHMENT I**

## **INJURY/ILLNESS PROCEDURE AND REPORT FORM**

## **TETRA TECH NUS, INC.**

### **INJURY/ILLNESS PROCEDURE WORKER'S COMPENSATION PROGRAM**

---

#### **WHAT YOU SHOULD DO IF YOU ARE INJURED OR DEVELOP AN ILLNESS AS A RESULT OF YOUR EMPLOYMENT:**

- Stop work as needed to ensure no further harm is done.
- If injury is minor, obtain appropriate first aid treatment.
- If injury or illness is severe or life threatening, obtain professional medical treatment at the nearest hospital emergency room. Check with your office location or project health and safety plan for specific instructions.
- If incident involves an injury, illness, or chemical exposure on a project work site, follow instructions in the Health & Safety Plan.
- Immediately report any injury or illness to your supervisor or office manager. In addition, you must contact your Human Resources representative, Marilyn Duffy at (412) 921-8475, and the Corporate Health and Safety Manager, Matt Soltis at (412) 921-8912 within 24 hours of the injury. You will be required to complete an [Injury/Illness Report](#). You may also be required to participate in a more detailed investigation with the Health Sciences Department.
- In the event of a serious near-miss incident, a "Serious Near Miss Report" (Form AR-2, available online at <https://go2.tetrattech.com> under "Departments", "Health and Safety", "Accident Reporting Procedures", hyperlink for "Serious Near Miss Report") must be completed and faxed to the Corporate Health and Safety Manager within 48 hours.
- If further medical treatment is needed, our insurance carrier, ACE, will provide information on the authorized providers customized to the location of the injured employee. You can find this information by accessing the website of ACE's claims handler, ESIS, at : [www.esis.com](http://www.esis.com). These providers are to be used for treatment of Worker's Compensation injuries subject to the laws of the state in which you work.

#### **ADDITIONAL QUESTIONS REGARDING WORKER'S COMPENSATION:**

Contact your local Human Resources representative (Marilyn Duffy), Corporate Health and Safety Manager (Matt Soltis), or Corporate Administration in Pasadena, California, at (626) 351-4664.

Worker's compensation is a state-mandated program that provides medical and disability benefits to employees who become disabled due to job related injury or illness. Tetra Tech, Inc. and its subsidiaries pay premiums on behalf of their employees. This program is based on a no-fault system, and benefits are provided for covered events as an exclusive remedy to the injured employee regardless of fault. The types of injuries or illnesses covered and the amount of

benefits paid are regulated by the state worker's compensation boards and vary from state to state. Corporate Administration in Pasadena is responsible for administering the Company's worker's compensation program. The following is a general explanation of worker's compensation provided in the event that you become injured or develop an illness as a result of your employment with Tetra Tech or any of its subsidiaries. Please be aware that the term used for worker's compensation varies from state to state.

### **WHO IS COVERED:**

All employees of Tetra Tech, whether they are on a full-time, part-time or temporary status, working in an office or in the field, are entitled to worker's compensation benefits from the first day of work. All employees must follow the above injury/illness reporting procedures. If you are working out-of-state and away from your home office, you are still eligible for worker's compensation benefits.

Consultants, independent contractors, and employees of subcontractors and employees from temporary employment agencies are not covered by Tetra Tech's Worker's Compensation plan.

### **WHAT IS COVERED:**

If you are injured or develop an illness caused by your employment, worker's compensation benefits are available to you subject to the laws of the state you work in. Injuries do not have to be serious; even injuries treated by first aid practices are covered and must be reported.



**TETRA TECH, INC.**

**ACCIDENT AND ILLNESS INVESTIGATION REPORT**

To: \_\_\_\_\_  
Subsidiary Health and Safety Representative

Prepared by: \_\_\_\_\_

Position: \_\_\_\_\_

cc: \_\_\_\_\_  
Workers Compensation Administrator

Office: \_\_\_\_\_

Project name: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Project number: \_\_\_\_\_

Fax number: \_\_\_\_\_

**Information Regarding Injured or Ill Employee**

Name: \_\_\_\_\_

Office: \_\_\_\_\_

Home address: \_\_\_\_\_

Gender: M ☐ F ☐ No. of dependents: \_\_\_\_\_

\_\_\_\_\_

Marital status: \_\_\_\_\_

Home telephone number: \_\_\_\_\_

Date of birth: \_\_\_\_\_

Occupation (regular job title): \_\_\_\_\_

Social security number: \_\_\_\_\_

Department: \_\_\_\_\_

**Date of Accident:** \_\_\_\_\_

**Time of Accident:** \_\_\_\_\_ a.m. ☐ p.m. ☐

**Time Employee Began Work:** \_\_\_\_\_

☐ Check if time cannot be determined

**Location of Incident**

Street address: \_\_\_\_\_

City, state, and zip code: \_\_\_\_\_

County: \_\_\_\_\_

Was place of accident or exposure on employer's premises? Yes ☐ No ☐

**Information About the Incident**

**What was the employee doing just before the incident occurred?** Describe the activity as well as the tools, equipment, or material the employee was using. Be specific. Examples: "Climbing a ladder while carrying roofing materials"; "Spraying chlorine from hand sprayer"; "Daily computer key-entry"

**What Happened?** Describe how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time"

This form contains information relating to employee health and must be used in a manner that protects the confidentiality of the employee to the extent possible while the information is being used for occupational safety and health purposes.



**TETRA TECH, INC.**

**ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)**

**Information About the Incident (Continued)**

**What was the injury or illness?** Describe the part(s) of the body affected and how it was affected. Be more specific than "hurt," "pain," or "sore." Examples "Strained back"; "Chemical burn, right hand"; "Carpal tunnel syndrome, left wrist"

**Describe the Object or Substance that Directly Harmed the Employee:** Examples: "Concrete floor"; "Chlorine"; "Radial arm saw." If this question does not apply to the incident, write "Not applicable."

Did the employee die? Yes ☐ No ☐ Date of death: \_\_\_\_\_

Was employee performing regular job duties? Yes ☐ No ☐

Was safety equipment provided? Yes ☐ No ☐ Was safety equipment used? Yes ☐ No ☐

**Note: Attach any police reports or related diagrams to this report.**

**Witness** (Attach additional sheets for other witnesses.)

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone number: \_\_\_\_\_

**Medical Treatment Required?** ☐ Yes ☐ No ☐ First aid only

Name of physician or health care professional: \_\_\_\_\_

If treatment was provided away from the work site, provide the information below.

Facility name: \_\_\_\_\_

Street address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip code: \_\_\_\_\_

Telephone number: \_\_\_\_\_

Was the employee treated in an emergency room? ☐ Yes ☐ No

Was the employee hospitalized over night as an in-patient? ☐ Yes ☐ No

This form contains information relating to employee health and must be used in a manner that protects the confidentiality of the employee to the extent possible while the information is being used for occupational safety and health purposes.



**TETRA TECH, INC.**

**ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)**

**Corrective Action(s) Taken by Unit Reporting the Accident:**

**Corrective Action Still to be Taken (by whom and when):**

**Name of Tetra Tech employee the injury or illness was first reported to:** \_\_\_\_\_

**Date of Report:** \_\_\_\_\_ **Time of Report:** \_\_\_\_\_

I have reviewed this investigation report and agree, to the best of my recollection, with its contents.

\_\_\_\_\_  
Printed Name of Injured Employee

\_\_\_\_\_  
Telephone Number

\_\_\_\_\_  
Signature of Injured Employee

\_\_\_\_\_  
Date

The signatures provided below indicate that appropriate personnel have been notified of the incident.

Title	Printed Name	Signature	Telephone Number	Date
Office Manager				
Project Manager				
Site Safety Coordinator or Office Health and Safety Representative				

This form contains information relating to employee health and must be used in a manner that protects the confidentiality of the employee to the extent possible while the information is being used for occupational safety and health purposes.



**TETRA TECH, INC.**

**ACCIDENT AND ILLNESS INVESTIGATION REPORT (Continued)**

**To Be Completed by the Subsidiary Health and Safety Representative**

**Classification of Incident:**

☐ Injury    ☐ Illness

**Result of Incident:**

- ☐ First aid only  
☐ Days away from work  
☐ Remained at work but incident resulted in job transfer or work restriction  
☐ Incident involved days away and job transfer or work restriction  
☐ Medical treatment only

No. of days away from work \_\_\_\_\_

Date employee left work \_\_\_\_\_

Date employee returned to work \_\_\_\_\_

No. of days placed on restriction or job transfer: \_\_\_\_\_

OSHA Recordable Case Number \_\_\_\_\_

**To Be Completed by Human Resources**

Social security number: \_\_\_\_\_

Date of hire: \_\_\_\_\_ Hire date for current job: \_\_\_\_\_

Wage information: \$ \_\_\_\_\_ per ☐ Hour ☐ Day ☐ Week ☐ Month

Position at time of hire: \_\_\_\_\_

Current position: \_\_\_\_\_ Shift hours: \_\_\_\_\_

State in which employee was hired: \_\_\_\_\_

Status: ☐ Full-time ☐ Part-time Hours per week: \_\_\_\_\_ Days per week: \_\_\_\_\_

Temporary job end date: \_\_\_\_\_

**To Be Completed during Report to Workers Compensation Carrier**

Date reported: \_\_\_\_\_ Reported by: \_\_\_\_\_

Confirmation number: \_\_\_\_\_

Name of contact: \_\_\_\_\_

Field office of claims adjuster: \_\_\_\_\_

This form contains information relating to employee health and must be used in a manner that protects the confidentiality of the employee to the extent possible while the information is being used for occupational safety and health purposes.



**ATTACHMENT II**  
**MEDICAL DATA SHEET**

# MEDICAL DATA SHEET

This Medical Data Sheet must be completed by all on-site personnel and kept in the command post during the conduct of site operations. This data sheet will accompany any personnel when medical assistance is needed or if transport to hospital facilities is required.

Project \_\_\_\_\_  
Name \_\_\_\_\_ Home Telephone \_\_\_\_\_  
Address \_\_\_\_\_  
City/State \_\_\_\_\_  
Age \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_  
Name of Next Kin \_\_\_\_\_  
Drug or other Allergies \_\_\_\_\_  
Particular Sensitivities \_\_\_\_\_  
Do You Wear Contacts? \_\_\_\_\_

Provide a Checklist of Previous Illnesses or Exposure to Hazardous Chemicals \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What medications are you presently using? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

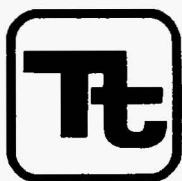
Do you have any medical restrictions? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name, Address, and Phone Number of personal physician: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

I am the individual described above. I have read and understand this HASP.

\_\_\_\_\_  
Signature Date

**ATTACHMENT III  
STANDARD OPERATING PROCEDURE  
FOR  
UTILITY LOCATING AND EXCAVATION  
CLEARANCE**



TETRA TECH NUS, INC.

# STANDARD OPERATING PROCEDURES

Number	HS-1.0	Page	1 of 15
Effective Date	12/03	Revision	2
Applicability	Tetra Tech NUS, Inc.		
Prepared	Health & Safety		
Approved	D. Senovich		
Subject	UTILITY LOCATING AND EXCAVATION CLEARANCE		

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## 1.0 PURPOSE

Utilities such as electric service lines, natural or propane gas lines, water and sewage lines, telecommunications, and steam lines are very often in the immediate vicinity of work locations. Contact with underground or overhead utilities can have serious consequences including employee injury/fatality, property and equipment damage, substantial financial impacts, and loss of utility service to users.

The purpose of this procedure is to provide minimum requirements and technical guidelines regarding the appropriate procedures to be followed when performing subsurface and overhead utility locating services. It is the policy of Tetra Tech NUS, Inc. (TtNUS) to provide a safe and healthful work environment for the protection of our employees. The purpose of this Standard Operating Procedure (SOP) is to aid in achieving the objectives of this policy, to present the acceptable procedures pertaining to utility locating and excavation clearance activities, and to present requirements and restrictions relevant to these types of activities. This SOP must be reviewed by any employee potentially involved with underground or overhead utility locating and avoidance activities.

## 2.0 SCOPE

This procedure applies to all TtNUS field activities where there may be potential contact with underground or overhead utilities. This procedure provides a description of the principles of operation, instrumentation, applicability, and implementability of typical methods used to determine the presence and avoidance of contact with utility services. This procedure is intended to assist with work planning and scheduling, resource planning, field implementation, and subcontractor procurement. Utility locating and excavation clearance requires site-specific information prior to the initiation of any such activities on a specific project. This SOP is not intended to provide a detailed description of methodology and instrument operation. Specialized expertise during both planning and execution of several of the methods presented may also be required.

## 3.0 GLOSSARY

Electromagnetic Induction (EMI) Survey - A geophysical exploration method whereby electromagnetic fields are induced in the ground and the resultant secondary electromagnetic fields are detected as a measure of ground conductivity.

Magnetometer – A device used for precise and sensitive measurements of magnetic fields.

Magnetic Survey – A geophysical survey method that depends on detection of magnetic anomalies caused by the presence of buried ferromagnetic objects.

Metal Detection – A geophysical survey method that is based on electromagnetic coupling caused by underground conductive objects.

Vertical Gradiometer – A magnetometer equipped with two sensors that are vertically separated by a fixed distance. It is best suited to map near surface features and is less susceptible to deep geologic features.

Ground Penetrating Radar – Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture.

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#### 4.0 RESPONSIBILITIES

Project Manager (PM)/Task Order Manager (TOM) - Responsible for ensuring that all field activities are conducted in accordance with this procedure.

Site Manager (SM)/Field Operations Leader (FOL) - Responsible for the onsite verification that all field activities are performed in compliance with approved SOPs or as otherwise directed by the approved project plan(s).

Site Health & Safety Officer (SHSO) – Responsible to provide technical assistance and verify full compliance with this SOP. The SHSO is also responsible for reporting any deficiencies to the Corporate Health and Safety Manager (HSM) and to the PM/TOM.

Health & Safety Manager (HSM) – Responsible for preparing, implementing, and modifying corporate health and safety policy and this SOP.

Site Personnel – Responsible for performing their work activities in accordance with this SOP and the TtNUS Health and Safety Policy.

#### 5.0 PROCEDURES

This procedure addresses the requirements and technical procedures that must be performed to minimize the potential for contact with underground and overhead utility services. These procedures are addressed individually from a buried and overhead standpoint.

##### 5.1 Buried Utilities

Buried utilities present a heightened concern because their location is not typically obvious by visual observation, and it is common that their presence and/or location is unknown or incorrectly known on client properties. This procedure must be followed prior to beginning any subsurface probing or excavation that might potentially be in the vicinity of underground utility services. In addition, the Utility Clearance Form (Attachment 3) must be completed for every location or cluster of locations where intrusive activities will occur.

Where the positive identification and de-energizing of underground utilities cannot be obtained and confirmed using the following steps, the PM/TOM is responsible for arranging for the procurement of a qualified, experienced, utility locating subcontractor who will accomplish the utility location and demarcation duties specified herein.

1. A comprehensive review must be made of any available property maps, blue lines, or as-builts prior to site activities. Interviews with local personnel familiar with the area should be performed to provide additional information concerning the location of potential underground utilities. Information regarding utility locations shall be added to project maps upon completion of this exercise.
- 2., A visual site inspection must be performed to compare the site plan information to actual field conditions. Any findings must be documented and the site plan/maps revised. The area(s) of proposed excavation or other subsurface activities must be marked at the site in white paint or pin flags to identify those locations of the proposed intrusive activities. The site inspection should focus on locating surface indications of potential underground utilities. Items of interest include the presence of nearby area lights, telephone service, drainage grates, fire hydrants, electrical service vaults/panels, asphalt/concrete scars and patches, and topographical depressions. Note the location of any emergency shut off switches. Any additional information regarding utility

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locations shall be added to project maps upon completion of this exercise and returned to the PM/TOM.

3. If the planned work is to be conducted on private property (e.g., military installations, manufacturing facilities, etc.) the FOL must identify and contact appropriate facility personnel (e.g., public works or facility engineering) before any intrusive work begins to inquire about (and comply with) property owner requirements. It is important to note that private property owners may require several days to several weeks advance notice prior to locating utilities.
4. If the work location is on public property, the state agency that performs utility clearances must be notified (see Attachment 1). State "one-call" services must be notified prior to commencing fieldwork per their requirements. Most one-call services require, by law, 48- to 72-hour advance notice prior to beginning any excavation. Such services typically assign a "ticket" number to the particular site. This ticket number must be recorded for future reference and is valid for a specific period of time, but may be extended by contacting the service again. The utility service will notify utility representatives who then mark their respective lines within the specified time frame. It should be noted that most military installations own their own utilities but may lease service and maintenance from area providers. Given this situation, "one call" systems may still be required to provide location services on military installations.
5. Utilities must be identified and their locations plainly marked using pin flags, spray paint, or other accepted means. The location of all utilities must be noted on a field sketch for future inclusion on project maps. Utility locations are to be identified using the following industry-standard color code scheme, unless the property owner or utility locator service uses a different color code:

white	excavation/subsurface investigation location
red	electrical
yellow	gas, oil, steam
orange	telephone, communications
blue	water, irrigation, slurry
green	sewer, drain
6. Where utility locations are not confirmed with a high degree of confidence through drawings, schematics, location services, etc., the work area must be thoroughly investigated prior to beginning the excavation. In these situations, utilities must be identified using safe and effective methods such as passive and intrusive surveys, or the use of non-conductive hand tools. Also, in situations where such hand tools are used, they should always be used in conjunction with suitable detection equipment, such as the items described in Section 6.0 of this SOP. Each method has advantages and disadvantages including complexity, applicability, and price. It also should be noted that in some states, initial excavation is required by hand to a specified depth.
7. At each location where trenching or excavating will occur using a backhoe or other heavy equipment, and where utility identifications and locations cannot be confirmed prior to groundbreaking, the soil must be probed using a device such as a tile probe which is made of non-conductive material such as fiberglass. If these efforts are not successful in clearing the excavation area of suspect utilities, hand shoveling must be performed for the perimeter of the intended excavation.
8. All utilities uncovered or undermined during excavation must be structurally supported to prevent potential damage. Unless necessary as an emergency corrective measure, TtNUS shall not make any repairs or modifications to existing utility lines without prior permission of the utility owner, property owner, and Corporate HSM. All repairs require that the line be locked-out/tagged-out prior to work.

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## 5.2 Overhead Power Lines

If it is necessary to work within the minimum clearance distance of an overhead power line, the overhead line must be de-energized and grounded, or re-routed by the utility company or a registered electrician. If protective measures such as guarding, isolating, or insulating are provided, these precautions must be adequate to prevent employees from contacting such lines directly with any part of their body or indirectly through conductive materials, tools, or equipment.

The following table provides the required minimum clearances for working in proximity to overhead power lines.

<u>Nominal Voltage</u>	<u>Minimum Clearance</u>
0 -50 kV	10 feet, or one mast length; whichever is greater
50+ kV	10 feet plus 4 inches for every 10 kV over 50 kV or 1.5 mast lengths; whichever is greater

## 6.0 UNDERGROUND LOCATING TECHNIQUES

A variety of supplemental utility locating approaches are available and can be applied when additional assurance is needed. The selection of the appropriate method(s) to employ is site-specific and should be tailored to the anticipated conditions, site and project constraints, and personnel capabilities.

### 6.1 Geophysical Methods

Geophysical methods include electromagnetic induction, magnetics, and ground penetrating radar. Additional details concerning the design and implementation of electromagnetic induction, magnetics, and ground penetrating radar surveys can be found in one or more of the TtNUS SOPs included in the References (Section 8.0).

#### **Electromagnetic Induction**

Electromagnetic Induction (EMI) line locators operate either by locating a background signal or by locating a signal introduced into the utility line using a transmitter. A utility line acts like a radio antenna, producing electrons, which can be picked up with a radiofrequency receiver. Electrical current carrying conductors have a 60HZ signal associated with them. This signal occurs in all power lines regardless of voltage. Utilities in close proximity to power lines or used as grounds may also have a 60HZ signal, which can be picked up with an EM receiver. A typical example of this type of geophysical equipment is an EM-61.

EMI locators specifically designed for utility locating use a special signal that is either indirectly induced onto a utility line by placing the transmitter above the line or directly induced using an induction clamp. The clamp induces a signal on the specific utility and is the preferred method of tracing since there is little chance of the resulting signals being interfered with. A good example of this type of equipment is the Schonstedt® MAC-51B locator. The MAC-51B performs inductively traced surveys, simple magnetic locating, and traced nonmetallic surveys.

When access can be gained inside a conduit to be traced, a flexible insulated trace wire can be used. This is very useful for non-metallic conduits but is limited by the availability of gaining access inside the pipe.



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## **Magnetics**

Magnetic locators operate by detecting the relative amounts of buried ferrous metal. They are incapable of locating or identifying nonferrous utility lines but can be very useful for locating underground storage tanks (UST's), steel utility lines, and buried electrical lines. A typical example of this type of equipment is the Schonstedt® GA-52Cx locator. The GA-52Cx is capable of locating 4-inch steel pipe up to 8 feet deep.

Non-ferrous lines are often located by using a typical plumbing tool (snake) fed through the line. A signal is then introduced to the snake that is then traced.

## **Ground Penetrating Radar**

Ground Penetrating Radar (GPR) involves specialized radar equipment whereby a signal is sent into the ground via a transmitter. Some portion of the signal will be reflected from the subsurface material, which is then recorded with a receiver and electronically converted into a graphic picture. In general, an object which is harder than the surrounding soil will reflect a stronger signal. Utilities, tunnels, UST's, and footings will reflect a stronger signal than the surrounding soil. Although this surface detection method may determine the location of a utility, this method does not specifically identify utilities (i.e., water vs. gas, electrical vs. telephone); hence, verification may be necessary using other methods. This method is somewhat limited when used in areas with clay soil types or with a high water table.

## **6.2 Passive Detection Surveys**

### **Acoustic Surveys**

Acoustic location methods are generally most applicable to waterlines or gas lines. A highly sensitive Acoustic Receiver listens for background sounds of water flowing (at joints, leaks, etc.) or to sounds introduced into the water main using a transducer. Acoustics may also be applicable to determine the location of plastic gas lines.

### **Thermal Imaging**

Thermal (i.e., infrared) imaging is a passive method for detecting the heat emitted by an object. Electronics in the infrared camera convert subtle heat differentials into a visual image on the viewfinder or a monitor. The operator does not look for an exact temperature; rather they look for heat anomalies (either elevated or suppressed temperatures) characteristic of a potential utility line.

The thermal fingerprint of underground utilities results from differences in temperature between the atmosphere and the fluid present in a pipe or the heat generated by electrical resistance. In addition, infrared scanners may be capable of detecting differences in the compaction, temperature and moisture content of underground utility trenches. High-performance thermal imagery can detect temperature differences to hundredths of a degree.

## **6.3 Intrusive Detection Surveys**

### **Vacuum Excavation**

Vacuum excavation is used to physically expose utility services. The process involves removing the surface material over approximately a 1' x 1' area at the site location. The air-vacuum process proceeds with the simultaneous action of compressed air-jets to loosen soil and vacuum extraction of the resulting

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debris. This process ensures the integrity of the utility line during the excavation process, as no hammers, blades, or heavy mechanical equipment comes into contact with the utility line, eliminating the risk of damage to utilities. The process continues until the utility is uncovered. Vacuum excavation can be used at the proposed site location to excavate below the "utility window" which is usually 8 feet.

### **Hand Excavation**

When the identification and location of underground utilities cannot be positively confirmed through document reviews and/or other methods, borings and excavations may be cleared via the use of non-conductive hand tools. This should always be done in conjunction with the use of detection equipment. This would be required for all locations where there is a potential to impact buried utilities. The minimum hand-excavation depth that must be reached is to be determined considering the geographical location of the work site. This approach recognizes that the placement of buried utilities is influenced by frost line depths that vary by geographical region. Attachment 2 presents frost line depths for the regions of the contiguous United States. At a minimum, hand excavation depths must be at least to the frost line depth (see Attachment 2) plus two (2) feet, but never less than 4 feet below ground surface (bgs). For hand excavation, the hole created must be reamed large enough to be at least the diameter of the drill rig auger or bit prior to drilling. For soil gas surveys, the survey probe shall be placed as close as possible to the cleared hand excavation. It is important to note that a post-hole digger must not be used in this type of hand excavation activity.

### **Tile Probe Surveys**

For some soil types, site conditions, and excavation requirements, non-conductive tile probes may be used. A tile probe is a "T"-handled rod of varying lengths that can be pushed into the soil to determine if any obstructions exist at that location. Tile probes constructed of fiberglass or other nonconductive material are readily-available from numerous vendors. Tile probes must be performed to the same depth requirements as previously specified. As with other types of hand excavating activities, the use of a non-conductive tile probe, should always be in conjunction with suitable utility locating detection equipment.

## **7.0 INTRUSIVE ACTIVITIES SUMMARY**

The following list summarizes the activities that must be performed prior to beginning subsurface activities:

1. Map and mark all subsurface locations and excavation boundaries using white paint or markers specified by the client or property owner.
2. Notify the property owner and/or client that the locations are marked. At this point, drawings of locations or excavation boundaries shall be provided to the property owner and/or client so they may initiate (if applicable) utility clearance.

Note: Drawings with confirmed locations should be provided to the property owner and/or client as soon as possible to reduce potential time delays.

3. Notify "One Call" service. If possible, arrange for an appointment to show the One Call representative the surface locations or excavation boundaries in person. This will provide a better location designation to the utilities they represent. You should have additional drawings should you need to provide plot plans to the One Call service.
4. Implement supplemental utility detection techniques as necessary and appropriate to conform utility locations or the absence thereof.

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5. Complete Attachment 3, Utility Clearance Form. This form should be completed for each excavation location. In situations where multiple subsurface locations exist within the close proximity of one another, one form may be used for multiple locations provided those locations are noted on the Utility Clearance Form. Upon completion, the Utility Clearance Form and revised/annotated utility location map becomes part of the project file.

## 8.0 REFERENCES

OSHA Letter of Interpretation, Mr. Joseph Caldwell, Attachment 4  
 OSHA 29 CFR 1926(b)(2)  
 OSHA 29 CFR 1926(b)(3)  
 TtNUS Utility Locating and Clearance Policy  
 TtNUS SOP GH-3.1; Resistivity and Electromagnetic Induction  
 TtNUS SOP GH-3.2; Magnetic and Metal Detection Surveys  
 TtNUS SOP GH-3.4; Ground-penetrating Radar Surveys

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**ATTACHMENT 1  
LISTING OF UNDERGROUND UTILITY CLEARANCE RESOURCES**



**American Public Works Association**  
2345 Grand Boulevard, Suite 500, Kansas City, MO 64108-2625  
Phone (816) 472-6100 • Fax (816) 472-1610  
Web [www.apwa.net](http://www.apwa.net) • E-mail [apwa@apwa.net](mailto:apwa@apwa.net)

**ONE-CALL SYSTEMS INTERNATIONAL  
CONDENSED DIRECTORY**

**Alabama**  
Alabama One-Call  
1-800-292-8525

**Alaska**  
Locate Call Center of Alaska, Inc.  
1-800-478-3121

**Arizona**  
Arizona Blue Stake  
1-800-782-5348

**Arkansas**  
Arkansas One Call System, Inc.  
1-800-482-8998

**California**  
Underground Service Alert North  
1-800-227-2600  
Underground Service Alert of Southern  
California  
1-800-227-2600

**Colorado**  
Utility Notification Center of Colorado  
1-800-922-1987

**Connecticut**  
Call Before You Dig  
1-800-922-4455

**Delaware**  
Miss Utility of Delmarva  
1-800-282-8555

**Florida**  
Sunshine State One-Call of Florida, Inc.  
1-800-432-4770

**Georgia**  
Underground Protection Center, Inc.  
1-800-282-7411

**Hawaii**  
Underground Service Alert North  
1-800-227-2600

**Idaho**  
Dig Line Inc.  
1-800-342-1585  
Kootenai County One-Call  
1-800-428-4950  
Shoshone - Benewah One-Call  
1-800-398-3285

**Illinois**  
JULIE, Inc.  
1-800-892-0123  
Digger (Chicago Utility Alert Network)  
312-744-7000

**Indiana**  
Indiana Underground Plant Protection  
Service  
1-800-382-5544

**Iowa**  
Iowa One-Call  
1-800-292-8989

**Kansas**  
Kansas One-Call System, Inc.  
1-800-344-7233

**Kentucky**  
Kentucky Underground Protection Inc.  
1-800-752-6007

**Louisiana**  
Louisiana One Call System, Inc.  
1-800-272-3020

**Maine**  
Dig Safe System, Inc.  
1-888-344-7233

**Maryland**  
Miss Utility  
1-800-257-7777  
Miss Utility of Delmarva  
1-800-282-8555

**Massachusetts**  
Dig Safe System, Inc.  
1-888-344-7233

**Michigan**  
Miss Dig System, Inc.  
1-800-482-7171

**Minnesota**  
Gopher State One Call  
1-800-252-1168

**Mississippi**  
Mississippi One-Call System, Inc.  
1-800-227-6477

**Missouri**  
Missouri One-Call System, Inc.  
1-800-344-7483

**Montana**  
Utilities Underground Protection Center  
1-800-424-5555  
Montana One Call Center  
1-800-551-8344

**Nebraska**  
Diggers Hotline of Nebraska  
1-800-331-5666

**Nevada**  
Underground Service Alert North  
1-800-227-2600

**New Hampshire**  
Dig Safe System, Inc.  
1-888-344-7233

**New Jersey**  
New Jersey One Call  
1-800-272-1000

**New Mexico**  
New Mexico One Call System, Inc.  
1-800-321-2537  
Las Cruces- Dona Ana Blue Stakes  
1-888-526-0400

**New York**  
Dig Safely New York  
1-800-962-7962  
New York City- Long Island One Call  
Center  
1-800-272-4480

**North Carolina**  
The North Carolina One-Call Center,  
Inc.  
1-800-632-4949

**North Dakota**  
North Dakota One-Call  
1-800-795-0555

**Ohio**  
Ohio Utilities Protection Service  
1-800-362-2764  
Oil & Gas Producers Underground  
Protect'n Svc  
1-800-925-0988

**Oklahoma**  
Call Okie  
1-800-522-6543

**Oregon**  
Oregon Utility Notification Center/One  
Call Concepts  
1-800-332-2344

**Pennsylvania**  
Pennsylvania One Call System, Inc.  
1-800-242-1776

**Rhode Island**  
Dig Safe System, Inc.  
1-888-344-7233

**South Carolina**  
Palmetto Utility Protection Service Inc.  
1-888-721-7877

**South Dakota**  
South Dakota One Call  
1-800-781-7474

**Tennessee**  
Tennessee One-Call System, Inc.  
1-800-351-1111

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### ATTACHMENT 1 (Continued)

**Texas**

Texas One Call System  
1-800-245-4545  
Texas Excavation Safety System, Inc.  
1-800-344-8377  
Lone Star Notification Center  
1-800-669-8344

**Utah**

Blue Stakes of Utah  
1-800-662-4111

**Vermont**

Dig Safe System, Inc.  
1-888-344-7233

**Virginia**

Miss Utility of Virginia  
1-800-552-7001  
Miss Utility (Northern Virginia)  
1-800-257-7777

**Washington**

Utilities Underground Location Center  
1-800-424-5555  
Northwest Utility Notification Center  
1-800-553-4344  
Inland Empire Utility Coordinating  
Council  
509-456-8000

**West Virginia**

Miss Utility of West Virginia, Inc.  
1-800-245-4848

**Wisconsin**

Diggers Hotline, Inc.  
1-800-242-8511

**Wyoming**

Wyoming One-Call System, Inc.  
1-800-348-1030  
Call Before You Dig of Wyoming  
1-800-849-2476

**District of Columbia**

Miss Utility  
1-800-257-7777

**Alberta**

Alberta One-Call Corporation  
1-800-242-3447

**British Columbia**

BC One Call  
1-800-474-6886

**Ontario**

Ontario One-Call System  
1-800-400-2255

**Quebec**

Info-Excavation  
1-800-663-9228

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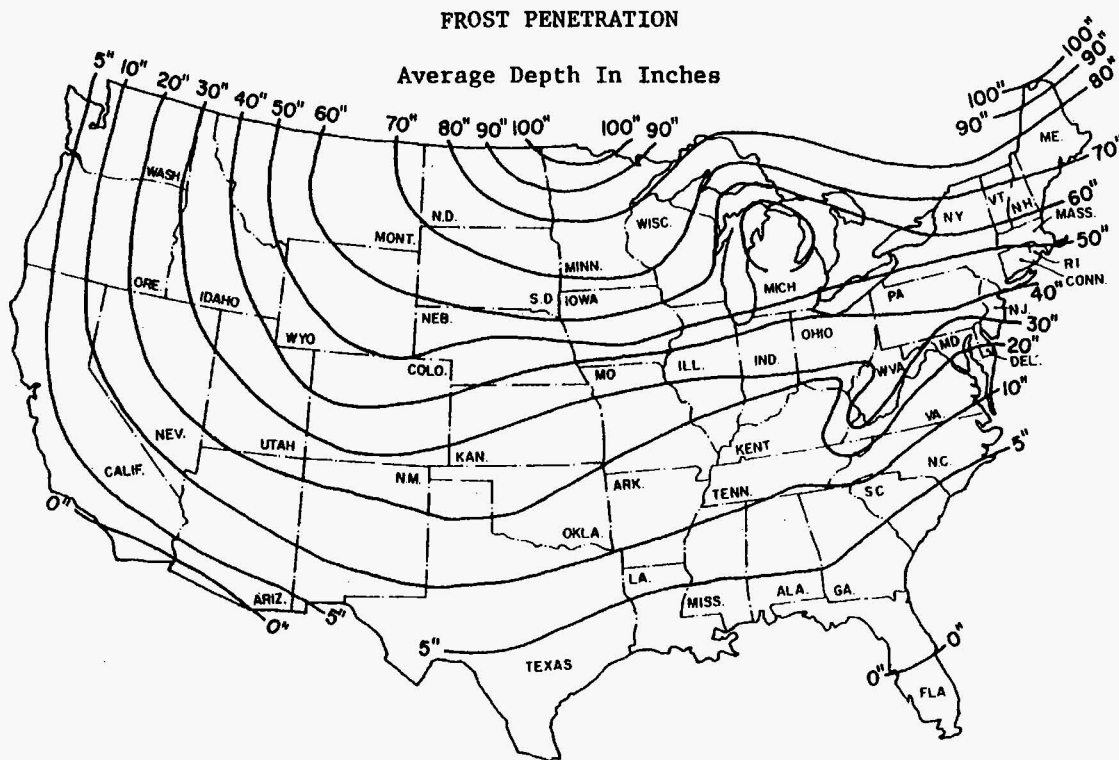
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## ATTACHMENT 2

### FROST LINE PENETRATION DEPTHS BY GEOGRAPHIC LOCATION



Courtesy U.S. Department Of Commerce

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**ATTACHMENT 3  
UTILITY CLEARANCE FORM**

Client: \_\_\_\_\_ Project Name: \_\_\_\_\_  
 Project No.: \_\_\_\_\_ Completed By: \_\_\_\_\_  
 Location Name: \_\_\_\_\_ Work Date: \_\_\_\_\_  
 Excavation Method/Overhead Equipment: \_\_\_\_\_

1. Underground Utilities Circle One
- a) Review of existing maps? yes no N/A
- b) Interview local personnel? yes no N/A
- c) Site visit and inspection? yes no N/A
- d) Excavation areas marked in the field? yes no N/A
- e) Utilities located in the field? yes no N/A
- f) Located utilities marked/added to site maps? yes no N/A
- g) Client contact notified yes no N/A  
 Name \_\_\_\_\_ Telephone: \_\_\_\_\_ Date: \_\_\_\_\_
- g) State One-Call agency called? yes no N/A  
 Caller: \_\_\_\_\_  
 Ticket Number: \_\_\_\_\_ Date: \_\_\_\_\_
- h) Geophysical survey performed? yes no N/A  
 Survey performed by: \_\_\_\_\_  
 Method: \_\_\_\_\_ Date: \_\_\_\_\_
- i) Hand excavation performed (with concurrent use of utility yes no N/A  
 detection device)?  
 Completed by: \_\_\_\_\_  
 Total depth: \_\_\_\_\_ feet Date: \_\_\_\_\_
- j) Trench/excavation probed? yes no N/A  
 Probing completed by: \_\_\_\_\_  
 Depth/frequency: \_\_\_\_\_ Date: \_\_\_\_\_
2. Overhead Utilities Present Absent
- a) Determination of nominal voltage yes no N/A
- b) Marked on site maps yes no N/A
- c) Necessary to lockout/insulate/re-route yes no N/A
- d) Document procedures used to lockout/insulate/re-route yes no N/A
- e) Minimum acceptable clearance (SOP Section 5.2): \_\_\_\_\_

3. Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Approval:

\_\_\_\_\_  
 Site Manager/Field Operations Leader

\_\_\_\_\_  
 Date

c: PM/Project File  
 Program File

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#### ATTACHMENT 4 OSHA LETTER OF INTERPRETATION

Mr. Joseph Caldwell  
Consultant  
Governmental Liaison  
Pipeline Safety Regulations  
211 Wilson Boulevard  
Suite 700  
Arlington, Virginia 22201

Re: Use of hydro-vacuum or non-conductive hand tools to locate underground utilities.

Dear Mr. Caldwell:

In a letter dated July 7, 2003, we responded to your inquiry of September 18, 2002, regarding the use of hydro-vacuum equipment to locate underground utilities by excavation. After our letter to you was posted on the OSHA website, we received numerous inquiries that make it apparent that aspects of our July 7 letter are being misunderstood. In addition, a number of industry stakeholders, including the National Utility Contractors Association (NUCA), have provided new information regarding equipment that is available for this work.

To clarify these issues, we are withdrawing our July 7 letter and issuing this replacement response to your inquiry.

***Question:** Section 1926.651 contains several requirements that relate to the safety of employees engaged in excavation work. Specifically, paragraphs (b)(2) and (b)(3) relate in part to the safety of the means used to locate underground utility installations that, if damaged during an uncovering operation, could pose serious hazards to employees.*

*Under these provisions, what constitutes an acceptable method of uncovering underground utility lines, and further, would the use of hydro-vacuum excavation be acceptable under the standard?*

#### **Answer**

##### Background

Two sections of 29 CFR 1926 Subpart P (Excavations), 1926.651(Specific excavation requirements), govern methods for uncovering underground utility installations. Specifically, paragraph (b)(2) states:

When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours \* \* \* or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used. (emphasis added).

Paragraph (b)(3) provides:



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#### ATTACHMENT 4 (Continued)

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means. (emphasis added).

Therefore, “acceptable means” must be used where the location of the underground utilities have not been identified by the utility companies and detection equipment is not used.

Subpart P does not contain a definition of either “other acceptable means” or “safe and acceptable means.” The preambles to both the proposed rule and the final rule discussed the rationale behind the wording at issue. For example, the preamble to the proposed rule, 52 Fed. Reg. 12301 (April 15, 1987), noted that a 1972 version of this standard contained language that specified “careful probing or hand digging” as the means to uncover utilities. The preamble then noted that an amendment to the 1972 standard later deleted that language “to allow other, *equally effective means* of locating such installations.” The preamble continued that in the 1987 proposed rule, OSHA again proposed using language in section (b)(3) that would provide another example of an acceptable method of uncovering utilities that could be used where the utilities have not been marked and detection equipment is not being used – “probing with hand-held tools.” This method was rejected in the final version of 29 CFR 1926. As OSHA explained in the preamble to the final rule, 54 Fed. Reg. 45916 (October 31, 1989):

OSHA received two comments \* \* \* and input from ACCSH [OSHA’s Advisory Committee on Construction Safety and Health] \* \* \* on this provision. All commenters recommended dropping ‘such as probing with hand-held tools’ from the proposed provision, because this could create a hazard to employees by damaging the installation or its insulation.

In other words, the commenters objected to the use of hand tools being used unless detection equipment was used in conjunction with them. OSHA then concluded its discussion relative to this provision by agreeing with the commentators and ultimately not including any examples of “acceptable means” in the final provision.

#### Non-conductive hand tools are permitted

This raises the question of whether the standard permits the use of hand tools alone -- without also using detection equipment. NUCA and other industry stakeholders have recently informed us that non-conductive hand tools that are appropriate to be used to locate underground utilities are now commonly available.

Such tools, such as a “shooter” (which has a non-conductive handle and a snub nose) and non-conductive or insulated probes were not discussed in the rulemaking. Since they were not considered at that time, they were not part of the class of equipment that was thought to be unsafe for this purpose. Therefore, we conclude that the use of these types of hand tools, when used with appropriate caution, is an “acceptable means” for locating underground utilities.

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#### ATTACHMENT 4 (Continued)

##### Hydro-vacuum excavation

It is our understanding that some hydro-vacuum excavation equipment can be adjusted to use a minimum amount of water and suction pressure. When appropriately adjusted so that the equipment will not damage underground utilities (especially utilities that are particularly vulnerable to damage, such as electrical lines), use of such equipment would be considered a "acceptable means" of locating underground utilities. However, if the equipment cannot be sufficiently adjusted, then this method would not be acceptable under the standard.

##### Other technologies

We are not suggesting that these are the only devices that would be "acceptable means" under the standard. Industry stakeholders have informed us that there are other types of special excavation equipment designed for safely locating utilities as well.

We apologize for any confusion our July 7 letter may have caused. If you have further concerns or questions, please feel free to contact us again by fax at: U.S. Department of Labor, OSHA, Directorate of Construction, Office of Construction Standards and Compliance Assistance, fax # 202-693-1689. You can also contact us by mail at the above office, Room N3468, 200 Constitution Avenue, N.W., Washington, D.C. 20210, although there will be a delay in our receiving correspondence by mail.

Sincerely,

Russell B. Swanson, Director  
Directorate of Construction

**NOTE:** OSHA requirements are set by statute, standards and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at <http://www.osha.gov>.

**ATTACHMENT IV**  
**EQUIPMENT INSPECTION CHECKLIST**

## EQUIPMENT INSPECTION

**COMPANY:** \_\_\_\_\_ **UNIT NO.** \_\_\_\_\_

**FREQUENCY:** Inspect daily, document prior to use and as repairs are needed.

Inspection Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time: \_\_\_\_\_ Equipment Type: \_\_\_\_\_

	(e.g., bulldozer)		
	Good	Need Repair	N/A
Tires or tracks	π	π	π
Hoses and belts	π	π	π
Cab, mirrors, safety glass	π	π	π
- Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	π	π	π
- Is the equipment equipped with audible back-up alarms and back-up lights?	π	π	π
Horn and gauges	π	π	π
Brake condition (dynamic, park, etc.)	π	π	π
Fire extinguisher (Type/Rating - _____)	π	π	π
Fluid Levels:			
- Engine oil	π	π	π
- Transmission fluid	π	π	π
- Brake fluid	π	π	π
- Cooling system fluid	π	π	π
- Windshield wipers	π	π	π
- Hydraulic oil	π	π	π
Oil leak/lube	π	π	π
Coupling devices and connectors	π	π	π
Exhaust system	π	π	π
Blade/boom/ripper condition	π	π	π
Accessways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	π	π	π
Power cable and/or hoist cable	π	π	π
Steering (standard and emergency)	π	π	π

### Safety Guards:

	Yes	No
- Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact? _____	π	π
- Hot pipes and surfaces exposed to accidental contact? _____	π	π
- All emergency shut offs have been identified and communicated to the field crew? _____	π	π
- Have emergency shutoffs been field tested? _____	π	π
- Results? _____	π	π
- Are any structural members bent, rusted, or otherwise show signs of damage? _____	π	π
- Are fueling cans used with this equipment approved type safety cans? _____	π	π
- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use? _____	π	π

**Portable Power Tools:**

- |   |       |       |
|---|-------|-------|
| – Tools and Equipment in Safe Condition? _____  | $\pi$ | $\pi$ |
| – Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? _____ | $\pi$ | $\pi$ |
| – Portable electric tools properly grounded? _____  | $\pi$ | $\pi$ |
| – Damage to electrical power cords? _____   | $\pi$ | $\pi$ |
| – Blade guards in place? _____  | $\pi$ | $\pi$ |
| – Components adjusted as per manufacturers recommendation? _____  | $\pi$ | $\pi$ |

**Cleanliness:**

- Overall condition (is the decontamination performed prior to arrival on-site considered acceptable)? \_\_\_\_\_
- Where was this equipment used prior to its arrival on site? \_\_\_\_\_
- Site Contaminants of concern at the previous site? \_\_\_\_\_
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls? \_\_\_\_\_

**Operator Qualifications (as applicable for all heavy equipment):**

- Does the operator have proper licensing where applicable, (e.g., CDL)? \_\_\_\_\_
- Does the operator, understand the equipments operating instructions? \_\_\_\_\_
- Is the operator experienced with this equipment? \_\_\_\_\_
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner? \_\_\_\_\_
- Is the operator 21 years of age or more? \_\_\_\_\_

**Identification:**

- Is a tagging system available, for positive identification, for tools removed from service? \_\_\_\_\_

**Additional Inspection Required Prior to Use On-Site**

- |   | <b>Yes</b> | <b>No</b> |
|---|------------|-----------|
| – Does equipment emit noise levels above 90 decibels?       | $\pi$      | $\pi$     |
| – If so, has an 8-hour noise dosimetry test been performed? | $\pi$      | $\pi$     |
| – Results of noise dosimetry: _____                         |            |           |
| – Defects and repairs needed: _____                         |            |           |
| – General Safety Condition: _____                           |            |           |
| – Operator or mechanic signature: _____                     |            |           |
| Approved for Use: $\pi$ Yes $\pi$ No                        |            |           |

\_\_\_\_\_  
Site Safety Officer Signature

**ATTACHMENT V**  
**SAFE WORK PERMITS**

**SAFE WORK PERMIT FOR  
MOBILIZATION AND DEMOBILIZATION  
NAS PENSACOLA FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

**I. Work limited to the following (description, area, equipment used):** Mob and Demob activities at UST 18

**II. Primary Hazards:** Lifting, pinches and compressions, slips, trip and falls, heavy equipment, vehicular and foot traffic, ambient temperature extremes, insect/animal bites and stings, poisonous plants, and inclement weather.

**III. Field Crew:** \_\_\_\_\_

**IV. On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector \_\_\_\_\_ TtNUS  
**Equipment Inspection required** ☐ Yes ☐ No Initials of Inspector \_\_\_\_\_ TtNUS

**V. Protective equipment required**

Level D ☒ Level B ☐  
Level C ☐ Level A ☐

Modifications/Exceptions: \_\_\_\_\_

**Respiratory equipment required**

Yes ☐ Specify on the reverse  
No ☒

VI. Chemicals of Concern	Hazard Monitoring	Action Level(s)	Response Measures
None expected during this task.	_____	_____	_____
_____	_____	_____	_____

**Primary Route(s) of Exposure/Hazard:** \_\_\_\_\_

**(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)**

**VII. Additional Safety Equipment/Procedures**

Hard-hat ..... ☐ Yes ☐ No  
Safety glasses ..... ☐ Yes ☐ No  
Chemical/splash goggles ..... ☐ Yes ☒ No  
Splash shield ..... ☐ Yes ☒ No  
Splash suits/coveralls ..... ☐ Yes ☒ No  
Impermeable apron ..... ☐ Yes ☒ No  
Steel toe work shoes or boots .... ☒ Yes ☐ No  
High visibility vest ..... ☐ Yes ☐ No  
First aid kit ..... ☐ Yes ☐ No  
Safety shower/Eyewash ..... ☐ Yes ☒ No

Modifications/Exceptions: \_\_\_\_\_

Hearing protection (Plugs/Muffs) ..... ☐ Yes ☐ No  
Safety belt/harness ..... ☐ Yes ☒ No  
Radio/cellular phone ..... ☐ Yes ☐ No  
Barricades ..... ☐ Yes ☒ No  
Gloves (Type – work ) ..... ☐ Yes ☐ No  
Work/rest regimen ..... ☐ Yes ☒ No  
Chemical resistant boot covers ..... ☐ Yes ☒ No  
Tape up/use insect repellent .. ☐ Yes ☐ No  
Fire extinguisher ..... ☐ Yes ☐ No  
Other ..... ☐ Yes ☐ No

VIII. Site Preparation	Yes	No	NA
Utility Locating and Excavation Clearance completed.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place .....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physical Hazards Identified and Isolated (Splash and containment barriers).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc). ....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**IX. Additional Permits required** (Hot work, confined space entry, excavation etc.) ..... ☐ Yes ☐ No  
*If yes, SHSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090*

**X. Special instructions, precautions:** \_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT FOR  
SOIL BORING  
NAS PENSACOLA FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

I. **Work limited to the following (description, area, equipment used):** DPT operations at UST 18

II. **Primary Hazards:** Chemical contamination, transfer contamination, pinch/compression, noise, energized systems, lifting, slips, trips and falls, vehicular and foot traffic, ambient temperature extremes, insect/animal bites, stings, poisonous plants, and inclement weather

III. **Field Crew:** \_\_\_\_\_

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector TtNUS

**Equipment Inspection required** ☐ Yes ☐ No Initials of Inspector TtNUS

V. **Protective equipment required**

Level D ☒ Level B ☐

Level C ☐ Level A ☐

Modifications/Exceptions: \_\_\_\_\_

**Respiratory equipment required**

Yes ☐ Specify on the reverse

No ☒

VI. **Chemicals of Concern**

Diesel fuel and related  
contaminants including  
VOCs and SVOCs

**Hazard Monitoring**

PID with 10.6 eV lamp  
or FID (precautionary)

Dust

**Action Level(s)**

Any sustained readings  
in worker breathing zone

visible dust

**Response Measures**

Suspend work and retreat to  
unaffected area until readings  
return to background levels  
Use area wetting techniques

**Primary Route(s) of Exposure/Hazard:** inhalation

**(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)**

VII. **Additional Safety Equipment/Procedures**

Hard-hat ..... ☒ Yes ☐ No

Safety glasses ..... ☒ Yes ☐ No

Chemical/splash goggles ..... ☐ Yes ☐ No

Splash shield ..... ☐ Yes ☐ No

Splash suits/coveralls ..... ☐ Yes ☐ No

Impermeable apron ..... ☐ Yes ☒ No

Steel toe work shoes or boots .... ☒ Yes ☐ No

High visibility vest ..... ☐ Yes ☒ No

First aid kit ..... ☐ Yes ☐ No

Safety shower/eyewash ..... ☐ Yes ☐ No

Modifications/Exceptions: \_\_\_\_\_

Hearing Protection (Plugs/Muffs) ..... ☒ Yes ☐ No

Safety belt/harness ..... ☐ Yes ☐ No

Radio/cellular phone ..... ☐ Yes ☐ No

Barricades ..... ☐ Yes ☒ No

Gloves (Type – nitrile ) ..... ☒ Yes ☐ No

Work/rest regimen ..... ☐ Yes ☐ No

Chemical resistant boot covers ..... ☐ Yes ☐ No

Tape up/use insect repellent ..... ☐ Yes ☐ No

Fire extinguisher ..... ☒ Yes ☐ No

Other ..... ☐ Yes ☐ No

VIII. **Site Preparation**

Utility Locating and Excavation Clearance completed ..... ☐ Yes ☐ No ☐ NA

Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place ..... ☐ Yes ☐ No ☐ NA

Physical Hazards Identified and Isolated (Splash and containment barriers) ..... ☐ Yes ☐ No ☐ NA

Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc) ..... ☐ Yes ☐ No ☐ NA

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.) ..... ☐ Yes ☐ No

*If yes, SHSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090*

X. **Special instructions, precautions:** \_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_



**SAFE WORK PERMIT FOR  
MULTIMEDIA SAMPLING  
NAS PENSACOLA FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

I. **Work limited to the following (description, area, equipment used):** Multimedia sampling including surface and groundwater, surface and subsurface soils and soil gas at UST 18

II. **Primary Hazards:** Chemical contamination, transfer contamination, pinch/compression, noise, lifting, slips, trips and falls, vehicular and foot traffic, ambient temperature extremes, insect/animal bites, stings, poisonous plants, and inclement weather

III. **Field Crew:** \_\_\_\_\_

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector TtNUS

**Equipment Inspection required** ☐ Yes ☐ No Initials of Inspector TtNUS

V. **Protective equipment required**

Level D ☒ Level B ☐

Level C ☐ Level A ☐

Modifications/Exceptions: \_\_\_\_\_

**Respiratory equipment required**

Yes ☐ Specify on the reverse

No ☒

VI. **Chemicals of Concern**

Diesel fuel and related  
contaminants including  
VOCs and SVOCs

**Hazard Monitoring**

PID with 10.6 eV lamp  
or FID (precautionary)

Dust

**Action Level(s)**

Any sustained readings  
in worker breathing zone

visible dust

**Response Measures**

Suspend work and retreat to  
unaffected area until readings  
return to background levels  
Use area wetting techniques

**Primary Route(s) of Exposure/Hazard:** inhalation

**(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)**

VII. **Additional Safety Equipment/Procedures**

Hard-hat ..... ☐ Yes ☐ No

Safety glasses ..... ☒ Yes ☐ No

Chemical/splash goggles ..... ☐ Yes ☐ No

Splash shield ..... ☐ Yes ☒ No

Splash suits/coveralls ..... ☐ Yes ☐ No

Impermeable apron ..... ☐ Yes ☒ No

Steel toe work shoes or boots .... ☒ Yes ☐ No

High visibility vest ..... ☐ Yes ☒ No

First aid kit ..... ☐ Yes ☐ No

Safety shower/eyewash ..... ☐ Yes ☐ No

Modifications/Exceptions: \_\_\_\_\_

Hearing protection (Plugs/Muffs)..... ☐ Yes ☐ No

Safety belt/harness ..... ☐ Yes ☐ No

Radio/cellular phone ..... ☐ Yes ☐ No

Barricades ..... ☐ Yes ☒ No

Gloves (Type – surgical style ) ..... ☒ Yes ☐ No

Work/rest regimen ..... ☐ Yes ☐ No

Chemical resistant boot covers ..... ☐ Yes ☒ No

Tape up/use insect repellent ..... ☐ Yes ☐ No

Fire Extinguisher ..... ☐ Yes ☐ No

Other ..... ☐ Yes ☐ No

VIII. **Site Preparation**

Utility Locating and Excavation Clearance completed..... ☐ Yes ☐ No ☐ NA

Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place ..... ☐ Yes ☐ No ☐ NA

Physical Hazards Identified and Isolated (Splash and containment barriers)..... ☐ Yes ☐ No ☐ NA

Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc.) ..... ☐ Yes ☐ No ☐ NA

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.)..... ☐ Yes ☐ No

*If yes, SHSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090*

X. **Special instructions, precautions:** \_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT FOR  
DECONTAMINATION  
NAS PENSACOLA FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

I. **Work limited to the following (description, area, equipment used):** Decontamination activities at UST 18

II. **Primary Hazards:** Chemical contamination, decontamination fluids, noise, lifting, flying projectiles, slips, trips and falls, vehicular and foot traffic, ambient temperature extremes, and inclement weather

III. **Field Crew:** \_\_\_\_\_

IV. **On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector TtNUS

**Equipment Inspection required** ☐ Yes ☐ No Initials of Inspector TtNUS

V. **Protective equipment required**

Level D ☒ Level B ☐

Level C ☐ Level A ☐

Modifications/Exceptions: \_\_\_\_\_

**Respiratory equipment required**

Yes ☐ Specify on the reverse

No ☒

VI. **Chemicals of Concern**

Diesel fuel and related  
contaminants including  
VOCs and SVOCs

**Hazard Monitoring**

PID with 10.6 eV lamp  
or FID (precautionary)

Dust

**Action Level(s)**

Any sustained readings  
in worker breathing zone

visible dust

**Response Measures**

Suspend work and retreat to  
unaffected area until readings  
return to background levels  
Use area wetting techniques

**Primary Route(s) of Exposure/Hazard:** \_\_\_\_\_

**(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)**

VII. **Additional Safety Equipment/Procedures**

Hard-hat ..... ☐ Yes ☒ No

Safety glasses ..... ☒ Yes ☐ No

Chemical/splash goggles ..... ☐ Yes ☒ No

Splash shield ..... ☒ Yes ☐ No

Splash suits/coveralls ..... ☒ Yes ☐ No

Impermeable apron ..... ☐ Yes ☐ No

Steel toe work shoes or boots .... ☒ Yes ☐ No

High visibility vest ..... ☐ Yes ☒ No

First aid kit ..... ☐ Yes ☐ No

Safety shower/eyewash ..... ☐ Yes ☐ No

Modifications/Exceptions: \_\_\_\_\_

Hearing protection (Plugs/Muffs) ..... ☒ Yes ☐ No

Safety belt/harness ..... ☐ Yes ☒ No

Radio/cellular phone ..... ☐ Yes ☐ No

Barricades ..... ☐ Yes ☒ No

Gloves (Type – nitrile ) ..... ☒ Yes ☐ No

Work/rest regimen ..... ☐ Yes ☒ No

Chemical resistant boot covers ..... ☐ Yes ☐ No

Tape up/use insect repellent ..... ☐ Yes ☐ No

Fire extinguisher ..... ☐ Yes ☐ No

Other ..... ☐ Yes ☐ No

VIII. **Site Preparation**

Utility Locating and Excavation Clearance completed ..... ☐ Yes ☐ No ☐ NA

Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place ..... ☐ Yes ☐ No ☐ NA

Physical Hazards Identified and Isolated (Splash and containment barriers) ..... ☐ Yes ☐ No ☐ NA

Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc). ..... ☐ Yes ☐ No ☐ NA

IX. **Additional Permits required** (Hot work, confined space entry, excavation etc.) ..... ☐ Yes ☐ No

*If yes, SHSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090*

X. **Special instructions, precautions:** \_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_

**SAFE WORK PERMIT FOR  
GEOGRAPHIC SURVEYING  
NAS PENSACOLA FLORIDA**

Permit No. \_\_\_\_\_ Date: \_\_\_\_\_ Time: From \_\_\_\_\_ to \_\_\_\_\_

**I. Work limited to the following (description, area, equipment used):** Geographic Survey at UST 18

**II. Primary Hazards:** Slips, trips and falls, ambient temperature extremes, inclement weather, insect/animal bites or stings, poisonous plants.

**III. Field Crew:** \_\_\_\_\_

**IV. On-site Inspection conducted** ☐ Yes ☐ No Initials of Inspector TtNUS

**Equipment Inspection required** ☐ Yes ☐ No Initials of Inspector TtNUS

**V. Protective equipment required**

Level D ☒ Level B ☐

Level C ☐ Level A ☐

Modifications/Exceptions: \_\_\_\_\_

**Respiratory equipment required**

Yes ☐ Specify on the reverse

No ☐

**VI. Chemicals of Concern**

**Hazard Monitoring**

**Action Level(s)**

**Response Measures**

None expected during this task.

**Primary Route(s) of Exposure/Hazard:** \_\_\_\_\_

**(Note to FOL and/or SSO: Each item in Sections VII, VIII, and IX must be checked Yes, No, or NA)**

**VII. Additional Safety Equipment/Procedures**

Hard-hat ..... ☐ Yes ☒ No

Safety glasses ..... ☐ Yes ☒ No

Chemical/splash goggles ..... ☐ Yes ☒ No

Splash shield ..... ☐ Yes ☒ No

Splash suits/coveralls ..... ☐ Yes ☒ No

Impermeable apron ..... ☐ Yes ☒ No

Steel toe work shoes or boots .... ☒ Yes ☐ No

High visibility vest ..... ☐ Yes ☐ No

First aid kit ..... ☐ Yes ☐ No

Safety shower/eyewash ..... ☐ Yes ☒ No

Modifications/Exceptions: \_\_\_\_\_

Hearing protection (Plugs/Muffs) ..... ☐ Yes ☒ No

Safety belt/harness ..... ☐ Yes ☒ No

Radio/cellular phone ..... ☐ Yes ☐ No

Barricades ..... ☐ Yes ☐ No

Gloves (Type - \_\_\_\_\_ ) ..... ☐ Yes ☒ No

Work/rest regimen ..... ☐ Yes ☐ No

Chemical resistant boot covers ..... ☐ Yes ☒ No

Tape up/use insect repellent ..... ☐ Yes ☐ No

Fire extinguisher ..... ☐ Yes ☐ No

Other ..... ☐ Yes ☐ No

**VIII. Site Preparation**

Yes No NA

Utility Locating and Excavation Clearance completed ..... ☐ ☐ ☐

Vehicle and Foot Traffic Routes Established/Traffic Control Barricades/Signs in Place ..... ☐ ☐ ☐

Physical Hazards Identified and Isolated (Splash and containment barriers) ..... ☐ ☐ ☐

Emergency Equipment Staged (Spill control, fire extinguishers, first aid kits, etc). ..... ☐ ☐ ☐

**IX. Additional Permits required** (Hot work, confined space entry, excavation etc.) ..... ☐ Yes ☐ No

*If yes, SHSO to complete or contact Health Sciences, Pittsburgh Office (412)921-7090*

**X. Special instructions, precautions:** \_\_\_\_\_

Permit Issued by: \_\_\_\_\_ Permit Accepted by: \_\_\_\_\_